Alicia Mullins

From: David Pickett
Sent: Tuesday, March 23, 2004 1:20 PM
To: Juan Portillo
Subject: ImmobileRD_STFF_element
Attachments: ImmobileRD_STFF_ attachment.wpd; Rd transforms for SZ in TPA.xls

Follow Up Flag: Follow up
Flag Status: Flagged

Juan,

Attached are electronic files associated with the subject questionnaire, provided to you today.

David

SZ Tuff Immobile Phase R_D for Reversible Colloid Model
David Pickett
3/23/2004

Relevant Parameters - this sheet applies only to these parameters when using the reversible colloid transport mode:

ImmobileRD_STFF_Am
ImmobileRD_STFF_Np
ImmobileRD_STFF_I
ImmobileRD_STFF_Tc
ImmobileRD_STFF_Cl
ImmobileRD_STFF_Cm
ImmobileRD_STFF_U
ImmobileRD_STFF_Pu
ImmobileRD_STFF_Th
ImmobileRD_STFF_Ra
ImmobileRD_STFF_Pb
ImmobileRD_STFF_Cs
ImmobileRD_STFF_Ni
ImmobileRD_STFF_C
ImmobileRD_STFF_Se
ImmobileRD_STFF_Nb

These parameters are constants.

Description

Retardation factor for [Am, etc.] in the saturated zone tuff immobile phase, adjusted for the effects of reversible colloid attachment.

Parameter Development

The TPA approach to modeling reversible colloid attachment involves an adjustment to solute transport parameters (K_D and R_D) that account for the increased mobility due to reversible attachment. Retardation in fractures is not modeled, consistent with the non-colloid case.

For transport in the SZ tuff, relevant parameters are the "immobile" phase retardation factors and the diffusion rate. (Fracture_RD_... values can remain unaltered as long as they continue to be unity.) These two parameters affect how solute is transferred from the mobile fracture phase to the "immobile" matrix. They are affected by reversible colloid attachment according to these equations:

$$R_{D,eff} = 1 + \frac{(1-\phi)\rho K_D}{\phi(1 + C_T F_T K_D)}$$

(Contardi et al., 2001, after Vilks et al., 1998) and

$$D_{eff} = \frac{D}{(1 + C_T F_T K_D)^2}$$

(modified from Equation 3 in CRWMS M&O, 2000, after CRWMS M&O, 1997, pages 8-32 to 8-36). φ is the tuff matrix porosity, equivalent to the input parameter ImmobilePorosity_STFF (currently a constant value of 0.2). ρ is the grain density of the tuff matrix; a value of 2650 kg/m^3 was used (Contardi et al., 2001). D is the diffusion coefficient, K_D is the matrix K_D (m^3/kg), C_T is the colloid concentration in water in saturated tuff matrix (kg/m^3), and F_T is a unitless factor accounting for surface area differences between matrix and colloids (Contardi et al., 2001). Default values for C_T and F_T are:

> C_T = 0.001 kg/m^3 (bounds 78% of the concentration data compiled by Contardi et al., 2001)
> F_T = 590 (typical value for tuff in Contardi et al., 2001).

The retardation factors (e.g., ImmobileRD_STFF_Am) are element specific, and so can be adjusted for colloids with the above equation. However, a single diffusion coefficient, DiffusionRate_STFF = 0.001 m^2/yr, is applied to all elements in TPA; adjustment of this parameter would be inappropriate because elements are affected to very different degrees by reversible attachment (see K_D term in D_{eff} equation). According to equations 10-1 and 10-2 of CNWRA (2002; TPA 4.0 Module Description and User's Guide), the retardation factor is inversely proportional to the rate of change of concentration in the immobile phase, while the diffusion coefficient is directly proportional. Therefore, the ratio of the diffusion coefficient to the retardation factor, both adjusted for reversible attachment, implements the colloidal effect on matrix diffusion. Because the diffusion coefficient cannot be adjusted (i.e., we cannot calculate D_{eff} for each element), the retardation factor $R_{D,eff}$ can be further adjusted so that the ratio is element specific. That is:

$$\frac{0.001}{R'_{D,eff}} = \frac{D_{eff}}{R_{D,eff}}$$

Using the equations above for D_{eff} and $R_{D,eff}$, knowing that D = 0.001 m^2/yr, and rearranging gives:

$$R'_{D,eff} = (1 + C_T F_T K_D)\left[(1 + C_T F_T K_D) + \left(\frac{1-\phi}{\phi}\right)\rho K_D\right]$$

This calculation should be applied to each "immobile" R_D value in the TPA input (e.g., ImmobileRD_STFF_Am) using an element-specific K_D (see below). The colloid adjustment can either be applied only to those radioelements with a non-unity value (Am, Np, Cm, U, Pu, Th, Ra, Pb, Cs, Ni, Se, and Nb) or to all radioelements (values that are unity will remain at unity, because the K_D calculated below will be zero). This formulation accounts for the competing effects of the two parameters on matrix diffusion.

The K_D value in the equation is not in the TPA input file; it must be extracted from the starting R_D (e.g., ImmobileRD_STFF_Am) in the input file, using this equation:

$$K_D = \frac{\phi}{(1-\phi)\rho}(R_D - 1)$$

(Freeze and Cherry, 1979), with φ and ρ as defined above. $R_{D,eff}$' can now be calculated and used in place of the input file value for the "immobile" R_D for each element.

Spreadsheet Calculations

This adjustment of the default constant immobile phase Rd's was accomplished in Microsoft Excel file "Rd transforms for SZ in TPA.xls" on worksheet "Immobile Rds." The new values for those elements with default non-unity Rd were originally provided to TPA staff in the file "Jan02_SZ_Rd_colloids_const.txt." (The file name was a misnomer, as the calculations were performed in January, 2003.) Note again that these values are only valid if the diffusion coefficient D = 0.001 m^2/yr.

References

Contardi, J. S., D. R. Turner and T. M. Ahn (2001). "Modeling colloid transport for performance assessment." Journal of Contaminant Hydrology **47**: 323-333.

CNWRA (2002) *Total-System Performance Assessment (TPA) Version 4.0 Code: Module Descriptions and User's Guide.* San Antonio, TX: CNWRA.

CRWMS M&O (1997) *The Site-Scale Unsaturated Zone Transport Model of Yucca Mountain.* Milestone SP25BM3, Rev. 1. Las Vegas, Nevada: CRWMS M&O.

CRWMS M&O (2000) *Input and Results of the Base Case Saturated Zone Flow and Transport Model for TSPA.* ANL-NBS-HS-000030 Rev. 00. Las Vegas, NV: CRWMS M&O.

Vilks, P., F. Caron and M. K. Haas (1998). "Potential for the formation and migration of colloidal material from a near-surface waste disposal site." Applied Geochemistry **13**: 31-42.

Old Name (TPA v4.1j)	PDF Type	minimum	maximum	log min	log max
AlluviumMatrixRD_SAV_Am	lognormal	7.50E+04	6.80E+10	4.875061	10.83251
AlluviumMatrixRD_SAV_Np	lognormal	1	3.90E+03	0	3.591065
AlluviumMatrixRD_SAV_I	constant	1			
AlluviumMatrixRD_SAV_Tc	constant	1			
AlluviumMatrixRD_SAV_Cl	constant	1			
AlluviumMatrixRD_SAV_Cm	constant	7.50E+04			
AlluviumMatrixRD_SAV_U	lognormal	1	1.90E+04	0	4.278754
AlluviumMatrixRD_SAV_Pu	lognormal	4.20E+02	3.90E+05	2.623249	5.591065
AlluviumMatrixRD_SAV_Th	lognormal	1.9	4.50E+07	0.278754	7.653213
AlluviumMatrixRD_SAV_Ra	loguniform	2.00E+03	8.00E+03	3.30103	3.90309
AlluviumMatrixRD_SAV_Pb	loguniform	2.00E+03	8.00E+03	3.30103	3.90309
AlluviumMatrixRD_SAV_Cs	loguniform	9.00E+04	1.00E+05	4.954243	5
AlluviumMatrixRD_SAV_Ni	loguniform	1.00E+03	8.00E+03	3	3.90309
AlluviumMatrixRD_SAV_C	constant	1			
AlluviumMatrixRD_SAV_Se	loguniform	1	500	0	2.69897
AlluviumMatrixRD_SAV_Nb	loguniform	2.00E+03	3.00E+04	3.30103	4.477121
ImmobileRD_STFF_Am	constant	1.80E+04			
ImmobileRD_STFF_Np	constant	19			
ImmobileRD_STFF_I	constant	1			
ImmobileRD_STFF_Tc	constant	1			
ImmobileRD_STFF_Cl	constant	1			
ImmobileRD_STFF_Cm	constant	1.80E+04			
ImmobileRD_STFF_U	constant	37			
ImmobileRD_STFF_Pu	constant	1.80E+03			
ImmobileRD_STFF_Th	constant	1.80E+04			
ImmobileRD_STFF_Ra	constant	5.40E+03			
ImmobileRD_STFF_Pb	constant	5.40E+03			
ImmobileRD_STFF_Cs	constant	9.00E+03			
ImmobileRD_STFF_Ni	constant	1.80E+03			
ImmobileRD_STFF_C	constant	1			
ImmobileRD_STFF_Se	constant	55			
ImmobileRD_STFF_Nb	constant	1.80E+04			

Kd's in m3/kg

C (kg/m3)	F (alluv)	tuff matrix density (kg/m3)	tuff matrix porosity	alluvium density (kg/m3)	alluvium porosity
0.001	630	2650	0.2	2500	0.125

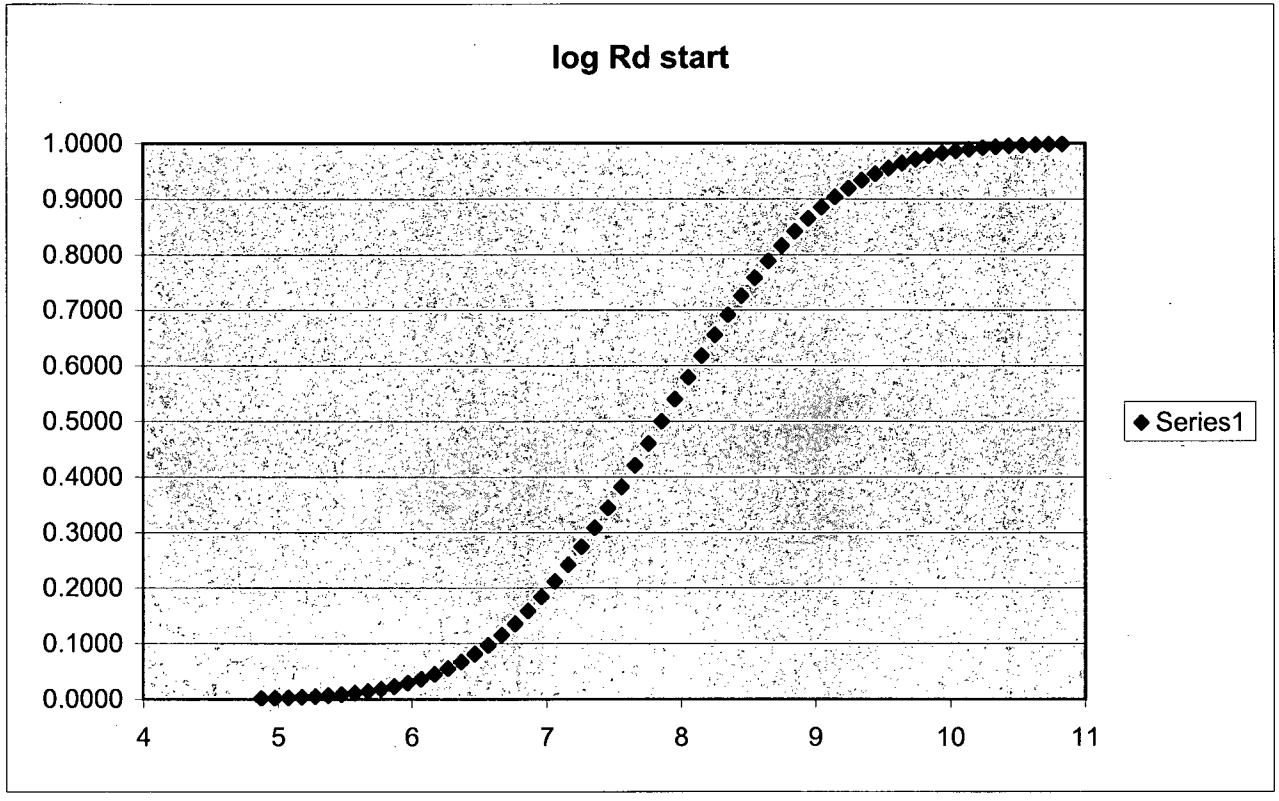
F (tuff)
590

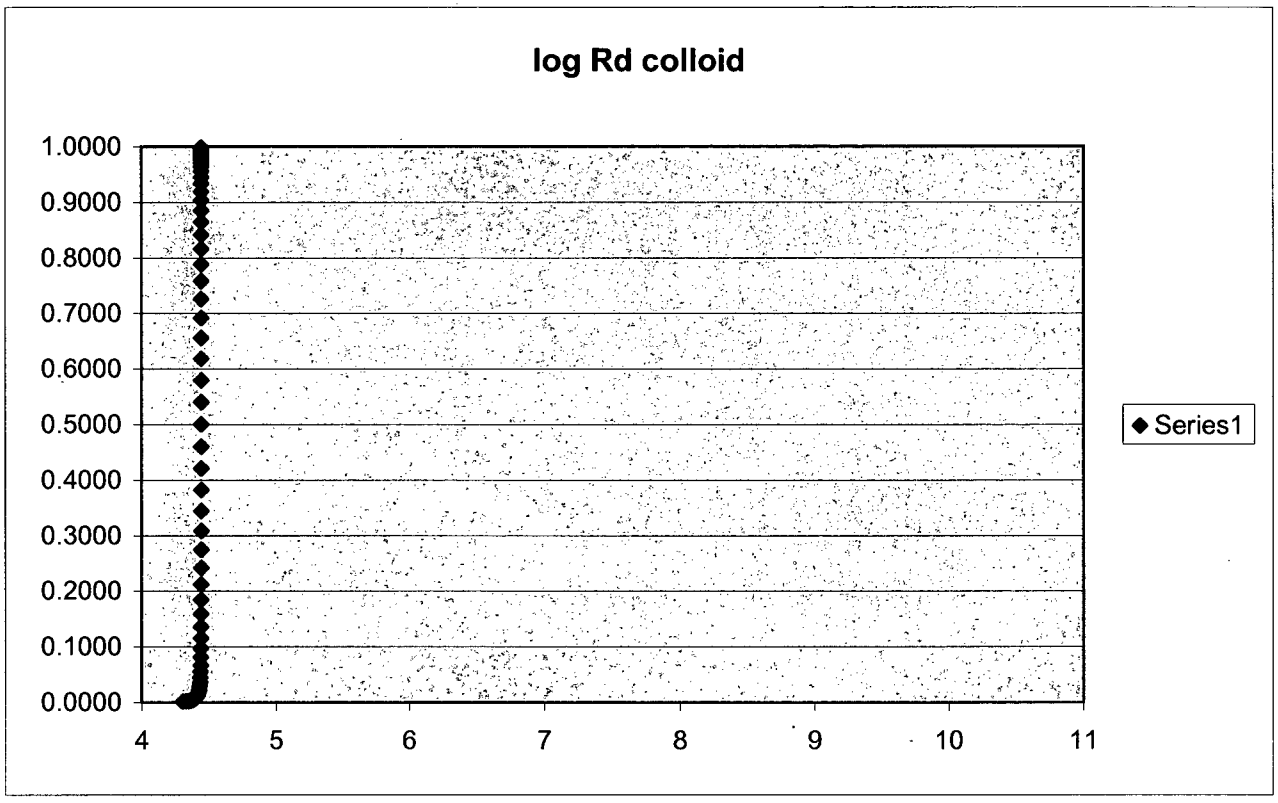
log min	log max
4.875061	10.83251
mean	sigma
7.853785	0.992908

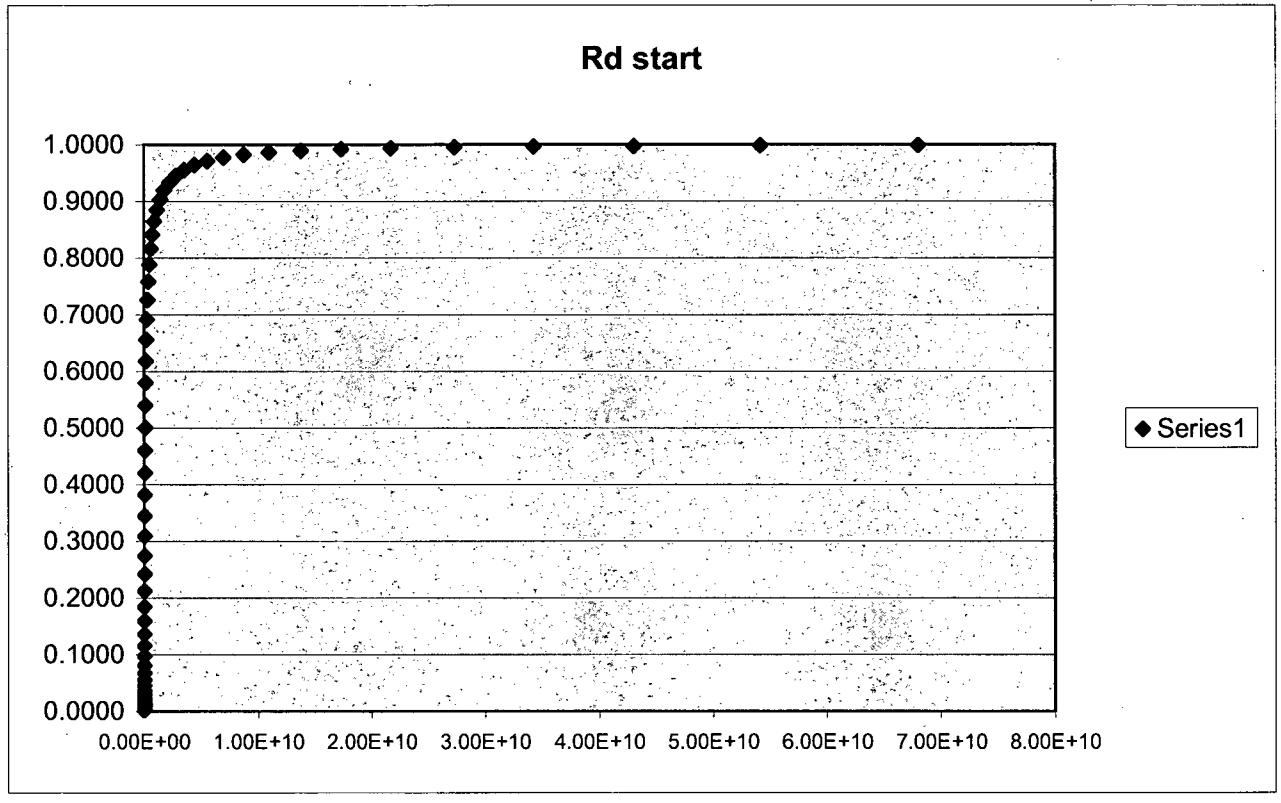
x	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff
4.875061	0.0013	7.50E+04	4.29E+00	2.03E+04	4.306879
4.974352	0.0019	9.43E+04	5.39E+00	2.15E+04	4.331555
5.073643	0.0026	1.18E+05	6.77E+00	2.25E+04	4.352242
5.172934	0.0035	1.49E+05	8.51E+00	2.34E+04	4.369434
5.272224	0.0047	1.87E+05	1.07E+01	2.42E+04	4.383617
5.371515	0.0062	2.35E+05	1.34E+01	2.48E+04	4.395241
5.470806	0.0082	2.96E+05	1.69E+01	2.54E+04	4.404717
5.570097	0.0107	3.72E+05	2.12E+01	2.58E+04	4.412407
5.669388	0.0139	4.67E+05	2.67E+01	2.62E+04	4.418625
5.768678	0.0179	5.87E+05	3.35E+01	2.65E+04	4.423636
5.867969	0.0228	7.38E+05	4.22E+01	2.68E+04	4.427664
5.96726	0.0287	9.27E+05	5.30E+01	2.70E+04	4.430896
6.066551	0.0359	1.17E+06	6.66E+01	2.71E+04	4.433485
6.165842	0.0446	1.47E+06	8.37E+01	2.73E+04	4.435556
6.265132	0.0548	1.84E+06	1.05E+02	2.74E+04	4.437211
6.364423	0.0668	2.31E+06	1.32E+02	2.74E+04	4.438532
6.463714	0.0808	2.91E+06	1.66E+02	2.75E+04	4.439586
6.563005	0.0968	3.66E+06	2.09E+02	2.76E+04	4.440426
6.662296	0.1151	4.60E+06	2.63E+02	2.76E+04	4.441096
6.761586	0.1357	5.78E+06	3.30E+02	2.76E+04	4.441629
6.860877	0.1587	7.26E+06	4.15E+02	2.77E+04	4.442054
6.960168	0.1841	9.12E+06	5.21E+02	2.77E+04	4.442393
7.059459	0.2119	1.15E+07	6.55E+02	2.77E+04	4.442662
7.15875	0.2420	1.44E+07	8.24E+02	2.77E+04	4.442877
7.25804	0.2743	1.81E+07	1.04E+03	2.77E+04	4.443048
7.357331	0.3085	2.28E+07	1.30E+03	2.77E+04	4.443184
7.456622	0.3446	2.86E+07	1.64E+03	2.78E+04	4.443292
7.555913	0.3821	3.60E+07	2.06E+03	2.78E+04	4.443378
7.655203	0.4207	4.52E+07	2.58E+03	2.78E+04	4.443446
7.754494	0.4602	5.68E+07	3.25E+03	2.78E+04	4.443501
7.853785	0.5000	7.14E+07	4.08E+03	2.78E+04	4.443544
7.953076	0.5398	8.98E+07	5.13E+03	2.78E+04	4.443579
8.052367	0.5793	1.13E+08	6.45E+03	2.78E+04	4.443606
8.151657	0.6179	1.42E+08	8.10E+03	2.78E+04	4.443628
8.250948	0.6554	1.78E+08	1.02E+04	2.78E+04	4.443645
8.350239	0.6915	2.24E+08	1.28E+04	2.78E+04	4.443659

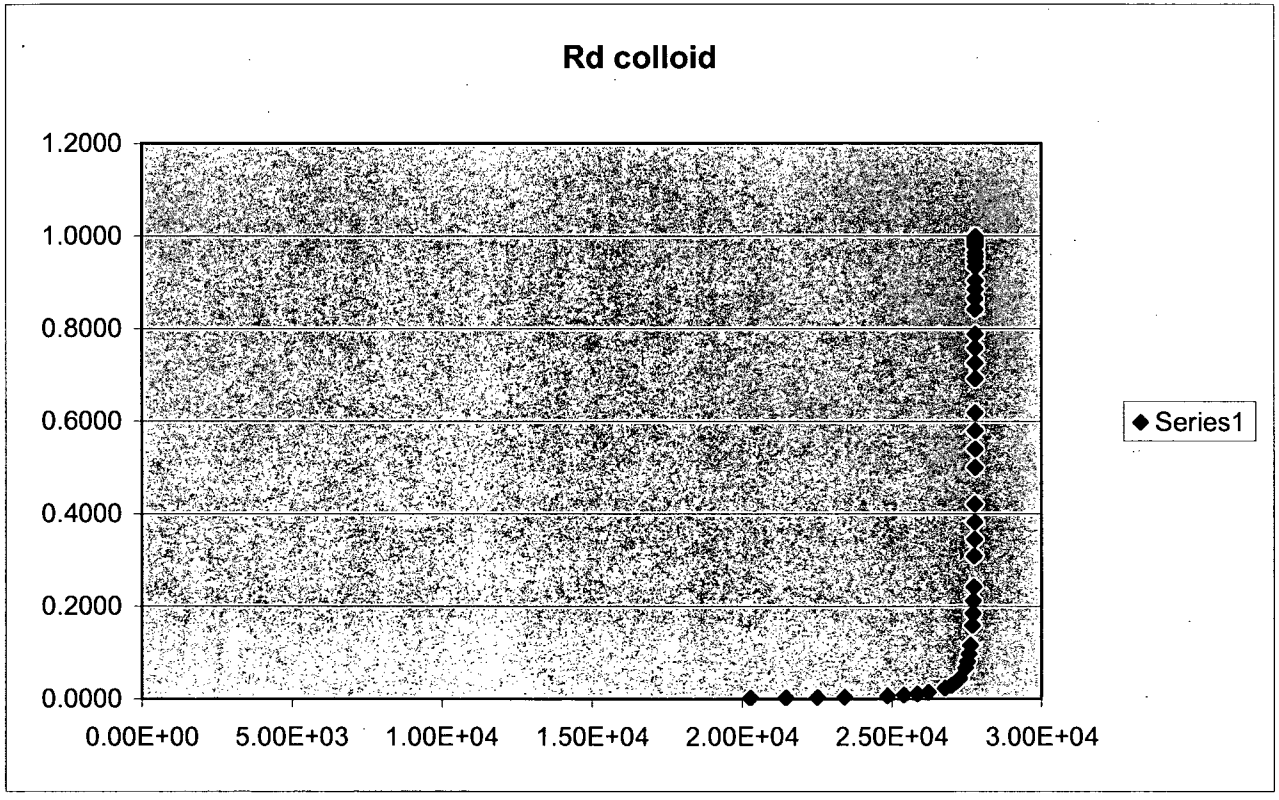
Rd,eff	cumul prob
2.03E+04	0.0013
2.15E+04	0.0019
2.25E+04	0.0026
2.34E+04	0.0035
2.48E+04	0.0062
2.54E+04	0.0082
2.58E+04	0.0107
2.62E+04	0.0139
2.68E+04	0.0228
2.70E+04	0.0287
2.71E+04	0.0359
2.73E+04	0.0446
2.74E+04	0.0668
2.75E+04	0.0808
2.76E+04	0.0968
2.76E+04	0.1151
2.77E+04	0.1587
2.77E+04	0.1841
2.77E+04	0.2119
2.77E+04	0.2420
2.77E+04	0.3085
2.78E+04	0.3446
2.78E+04	0.3821
2.78E+04	0.4207
2.78E+04	0.5000
2.78E+04	0.5398
2.78E+04	0.5793
2.78E+04	0.6179
2.78E+04	0.6915
2.78E+04	0.7257
2.78E+04	0.7580
2.78E+04	0.7881
2.78E+04	0.8413
2.78E+04	0.8643
2.78E+04	0.8849
2.78E+04	0.9032

8.44953	0.7257	2.82E+08	1.61E+04	2.78E+04	4.44367	2.78E+04	0.9332
8.548821	0.7580	3.54E+08	2.02E+04	2.78E+04	4.443679	2.78E+04	0.9452
8.648111	0.7881	4.45E+08	2.54E+04	2.78E+04	4.443686	2.78E+04	0.9554
8.747402	0.8159	5.59E+08	3.19E+04	2.78E+04	4.443692	2.78E+04	0.9641
8.846693	0.8413	7.03E+08	4.01E+04	2.78E+04	4.443696	2.78E+04	0.9772
8.945984	0.8643	8.83E+08	5.05E+04	2.78E+04	4.443699	2.78E+04	0.9821
9.045275	0.8849	1.11E+09	6.34E+04	2.78E+04	4.443702	2.78E+04	0.9861
9.144565	0.9032	1.39E+09	7.97E+04	2.78E+04	4.443704	2.78E+04	0.9893
9.243856	0.9192	1.75E+09	1.00E+05	2.78E+04	4.443706	2.78E+04	0.9938
9.343147	0.9332	2.20E+09	1.26E+05	2.78E+04	4.443708	2.78E+04	0.9953
9.442438	0.9452	2.77E+09	1.58E+05	2.78E+04	4.443709	2.78E+04	0.9965
9.541729	0.9554	3.48E+09	1.99E+05	2.78E+04	4.44371	2.78E+04	0.9974
9.641019	0.9641	4.38E+09	2.50E+05	2.78E+04	4.44371	2.78E+04	0.9981
9.74031	0.9713	5.50E+09	3.14E+05	2.78E+04	4.443711	2.78E+04	0.9987
9.839601	0.9772	6.91E+09	3.95E+05	2.78E+04	4.443711		
9.938892	0.9821	8.69E+09	4.96E+05	2.78E+04	4.443712		
10.03818	0.9861	1.09E+10	6.24E+05	2.78E+04	4.443712		
10.13747	0.9893	1.37E+10	7.84E+05	2.78E+04	4.443712		
10.23676	0.9918	1.72E+10	9.86E+05	2.78E+04	4.443712		
10.33605	0.9938	2.17E+10	1.24E+06	2.78E+04	4.443713		
10.43535	0.9953	2.72E+10	1.56E+06	2.78E+04	4.443713		
10.53464	0.9965	3.42E+10	1.96E+06	2.78E+04	4.443713		
10.63393	0.9974	4.30E+10	2.46E+06	2.78E+04	4.443713		
10.73322	0.9981	5.41E+10	3.09E+06	2.78E+04	4.443713		
10.83251	0.9987	6.80E+10	3.89E+06	2.78E+04	4.443713		


log Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
4
5
6
7
8
9
10
11
Series1


log Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
4
5
6
7
8
9
10
11
Series1

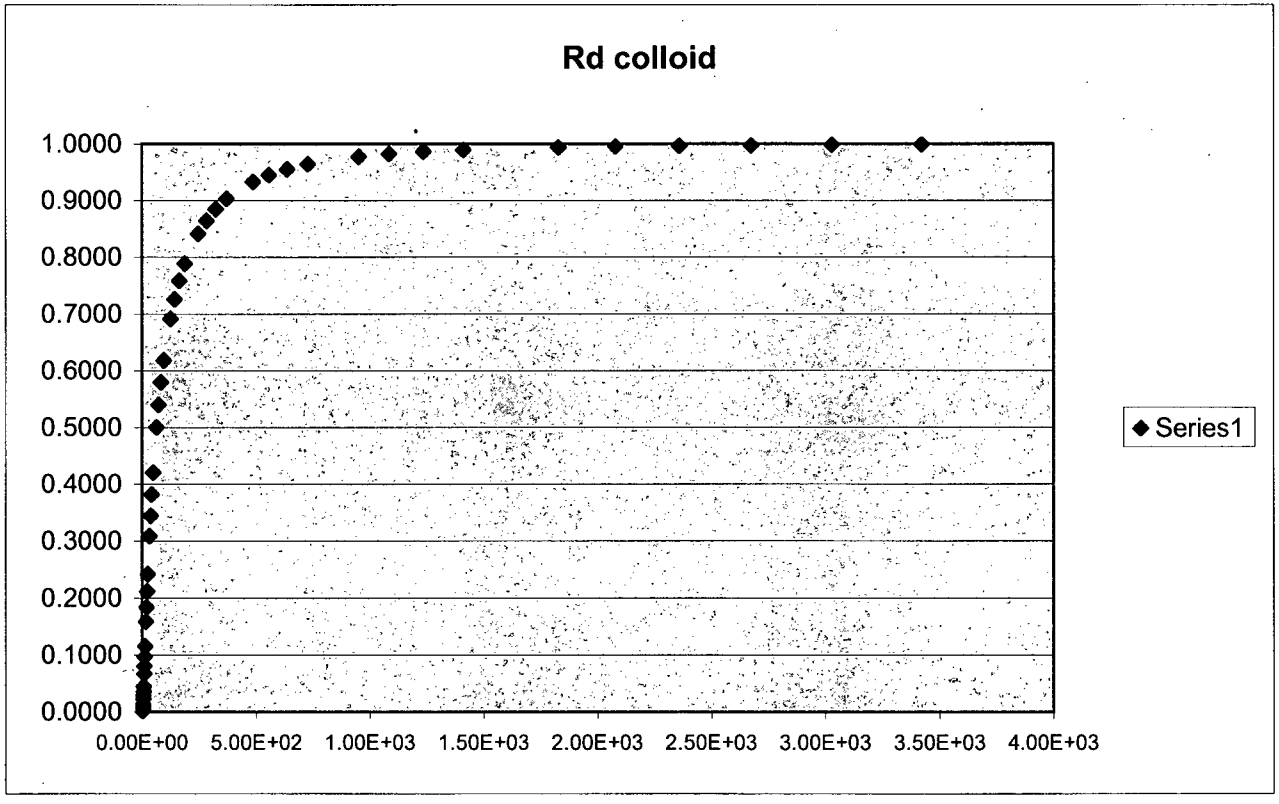

Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
1.00E+10
2.00E+10
3.00E+10
4.00E+10
5.00E+10
6.00E+10
7.00E+10
8.00E+10
Series1


Rd colloid
1.2000
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
2.50E+04
3.00E+04
Series1

log min	log max
0	3.591065
mean	sigma
1.795532	0.598511

x	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
0	0.0013	1.00E+00	0.00E+00	1.00E+00	0	1.00E+00	0.0013
0.059851	0.0019	1.15E+00	8.44E-06	1.15E+00	0.059851	1.15E+00	0.0019
0.119702	0.0026	1.32E+00	1.81E-05	1.32E+00	0.119701	1.32E+00	0.0026
0.179553	0.0035	1.51E+00	2.93E-05	1.51E+00	0.179551	1.51E+00	0.0035
0.239404	0.0047	1.74E+00	4.20E-05	1.74E+00	0.239399	1.99E+00	0.0062
0.299255	0.0062	1.99E+00	5.67E-05	1.99E+00	0.299248	2.29E+00	0.0082
0.359106	0.0082	2.29E+00	7.35E-05	2.29E+00	0.359095	2.62E+00	0.0107
0.418958	0.0107	2.62E+00	9.28E-05	2.62E+00	0.418942	3.01E+00	0.0139
0.478809	0.0139	3.01E+00	1.15E-04	3.01E+00	0.478788	3.97E+00	0.0228
0.53866	0.0179	3.46E+00	1.40E-04	3.46E+00	0.538632	4.55E+00	0.0287
0.598511	0.0228	3.97E+00	1.70E-04	3.97E+00	0.598476	5.23E+00	0.0359
0.658362	0.0287	4.55E+00	2.03E-04	4.55E+00	0.658318	6.00E+00	0.0446
0.718213	0.0359	5.23E+00	2.42E-04	5.23E+00	0.718159	7.90E+00	0.0668
0.778064	0.0446	6.00E+00	2.86E-04	6.00E+00	0.777999	9.07E+00	0.0808
0.837915	0.0548	6.89E+00	3.36E-04	6.88E+00	0.837836	1.04E+01	0.0968
0.897766	0.0668	7.90E+00	3.94E-04	7.90E+00	0.897672	1.19E+01	0.1151
0.957617	0.0808	9.07E+00	4.61E-04	9.07E+00	0.957505	1.57E+01	0.1587
1.017468	0.0968	1.04E+01	5.38E-04	1.04E+01	1.017335	1.81E+01	0.1841
1.077319	0.1151	1.19E+01	6.26E-04	1.19E+01	1.077163	2.07E+01	0.2119
1.13717	0.1357	1.37E+01	7.27E-04	1.37E+01	1.136986	2.38E+01	0.2420
1.197022	0.1587	1.57E+01	8.42E-04	1.57E+01	1.196806	3.13E+01	0.3085
1.256873	0.1841	1.81E+01	9.75E-04	1.81E+01	1.256621	3.59E+01	0.3446
1.316724	0.2119	2.07E+01	1.13E-03	2.07E+01	1.31643	4.12E+01	0.3821
1.376575	0.2420	2.38E+01	1.30E-03	2.38E+01	1.376233	4.73E+01	0.4207
1.436426	0.2743	2.73E+01	1.50E-03	2.73E+01	1.43603	6.23E+01	0.5000
1.496277	0.3085	3.14E+01	1.73E-03	3.13E+01	1.495818	7.15E+01	0.5398
1.556128	0.3446	3.60E+01	2.00E-03	3.59E+01	1.555597	8.20E+01	0.5793
1.615979	0.3821	4.13E+01	2.30E-03	4.12E+01	1.615365	9.41E+01	0.6179
1.67583	0.4207	4.74E+01	2.65E-03	4.73E+01	1.675121	1.24E+02	0.6915
1.735681	0.4602	5.44E+01	3.05E-03	5.43E+01	1.734862	1.42E+02	0.7257
1.795532	0.5000	6.24E+01	3.51E-03	6.23E+01	1.794588	1.63E+02	0.7580
1.855383	0.5398	7.17E+01	4.04E-03	7.15E+01	1.854295	1.87E+02	0.7881
1.915234	0.5793	8.23E+01	4.64E-03	8.20E+01	1.913981	2.46E+02	0.8413
1.975086	0.6179	9.44E+01	5.34E-03	9.41E+01	1.973643	2.82E+02	0.8643
2.034937	0.6554	1.08E+02	6.14E-03	1.08E+02	2.033277	3.23E+02	0.8849
2.094788	0.6915	1.24E+02	7.05E-03	1.24E+02	2.092878	3.70E+02	0.9032

2.154639	0.7257	1.43E+02	8.10E-03	1.42E+02	2.152443	4.85E+02	0.9332
2.21449	0.7580	1.64E+02	9.31E-03	1.63E+02	2.211966	5.55E+02	0.9452
2.274341	0.7881	1.88E+02	1.07E-02	1.87E+02	2.271441	6.35E+02	0.9554
2.334192	0.8159	2.16E+02	1.23E-02	2.14E+02	2.330861	7.27E+02	0.9641
2.394043	0.8413	2.48E+02	1.41E-02	2.46E+02	2.390218	9.49E+02	0.9772
2.453894	0.8643	2.84E+02	1.62E-02	2.82E+02	2.449502	1.08E+03	0.9821
2.513745	0.8849	3.26E+02	1.86E-02	3.23E+02	2.508703	1.24E+03	0.9861
2.573596	0.9032	3.75E+02	2.13E-02	3.70E+02	2.567809	1.41E+03	0.9893
2.633447	0.9192	4.30E+02	2.45E-02	4.23E+02	2.626807	1.83E+03	0.9938
2.693298	0.9332	4.94E+02	2.81E-02	4.85E+02	2.685681	2.08E+03	0.9953
2.75315	0.9452	5.66E+02	3.23E-02	5.55E+02	2.744414	2.36E+03	0.9965
2.813001	0.9554	6.50E+02	3.71E-02	6.35E+02	2.802984	2.68E+03	0.9974
2.872852	0.9641	7.46E+02	4.26E-02	7.27E+02	2.86137	3.03E+03	0.9981
2.932703	0.9713	8.56E+02	4.89E-02	8.31E+02	2.919546	3.42E+03	0.9987
2.992554	0.9772	9.83E+02	5.61E-02	9.49E+02	2.977481		
3.052405	0.9821	1.13E+03	6.44E-02	1.08E+03	3.035145		
3.112256	0.9861	1.29E+03	7.39E-02	1.24E+03	3.092498		
3.172107	0.9893	1.49E+03	8.49E-02	1.41E+03	3.1495		
3.231958	0.9918	1.71E+03	9.74E-02	1.61E+03	3.206104		
3.291809	0.9938	1.96E+03	1.12E-01	1.83E+03	3.262258		
3.35166	0.9953	2.25E+03	1.28E-01	2.08E+03	3.317904		
3.411511	0.9965	2.58E+03	1.47E-01	2.36E+03	3.372978		
3.471362	0.9974	2.96E+03	1.69E-01	2.68E+03	3.42741		
3.531214	0.9981	3.40E+03	1.94E-01	3.03E+03	3.481124		
3.591065	0.9987	3.90E+03	2.23E-01	3.42E+03	3.534037		


Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+02
1.00E+03
1.50E+03
2.00E+03
2.50E+03
3.00E+03
3.50E+03
4.00E+03
Series1

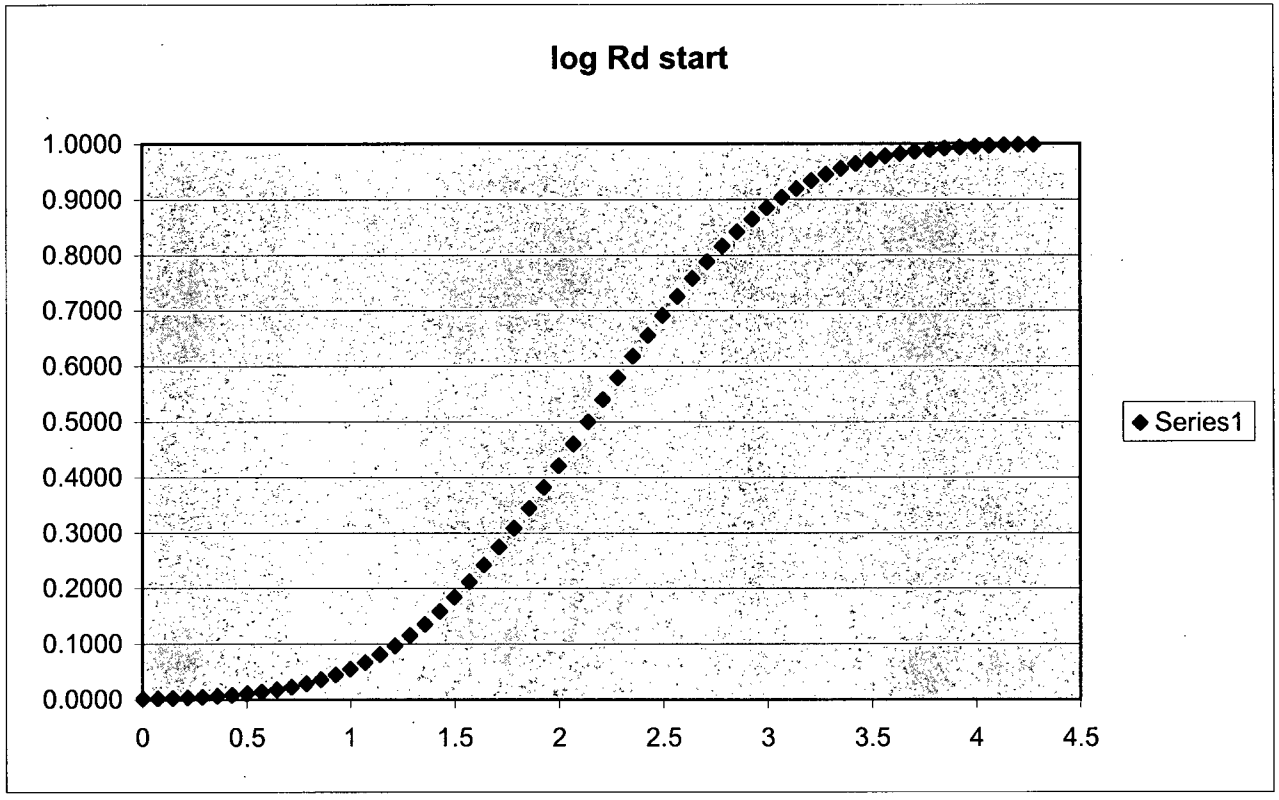
			calc Kd	Rd,eff
AlluviumMatrixRD_SAV_Cm	constant	7.50E+04	4.29E+00	2.03E+04

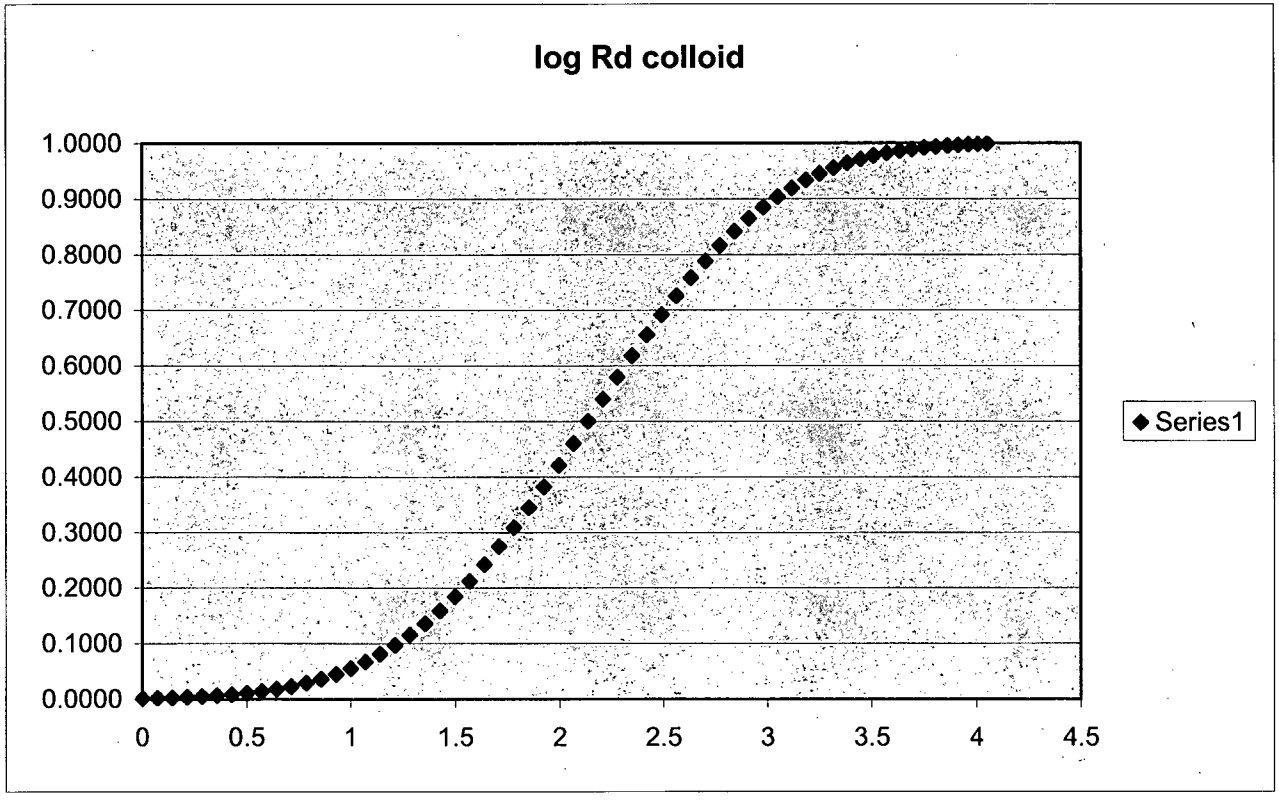
log min	log max
0	4.278754
mean	sigma
2.139377	0.713126

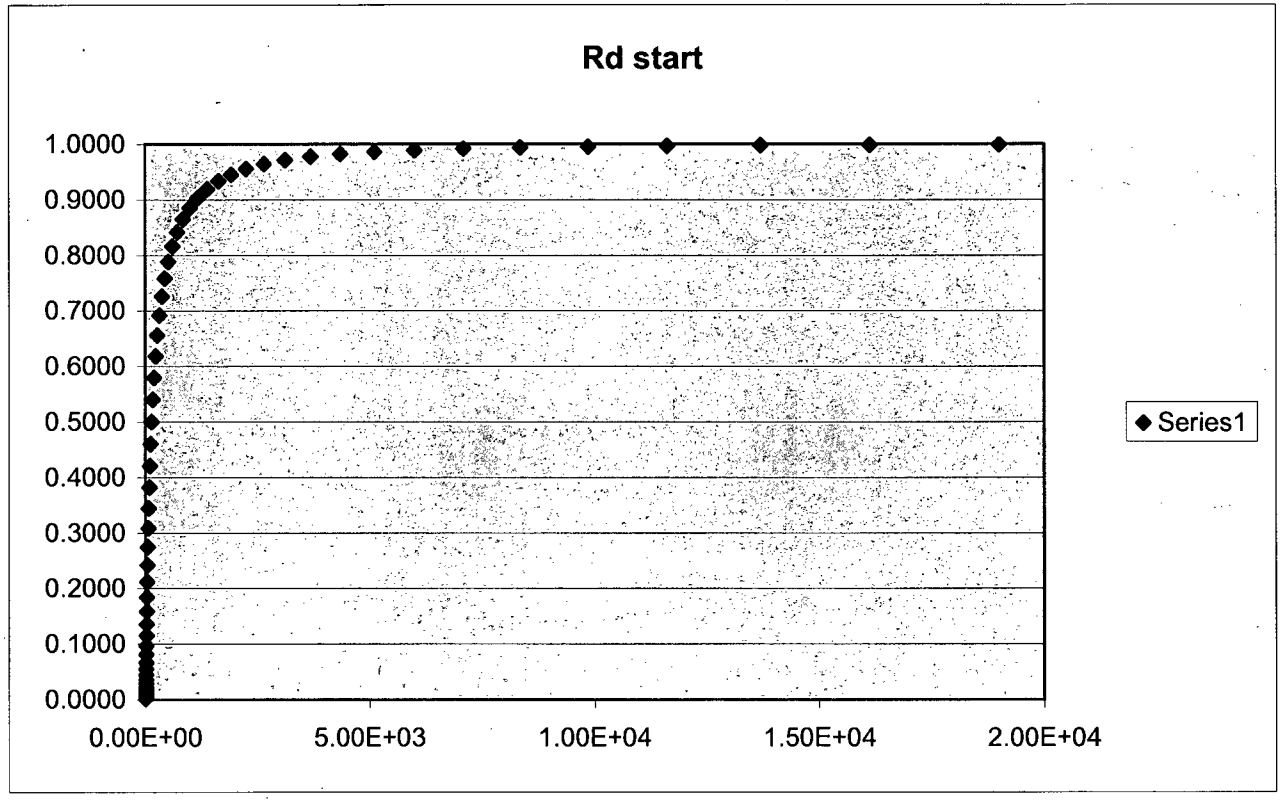
x	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff
0	0.0013	1.00E+00	0.00E+00	1.00E+00	0
0.071313	0.0019	1.18E+00	1.02E-05	1.18E+00	0.071312
0.142625	0.0026	1.39E+00	2.22E-05	1.39E+00	0.142623
0.213938	0.0035	1.64E+00	3.64E-05	1.64E+00	0.213934
0.28525	0.0047	1.93E+00	5.31E-05	1.93E+00	0.285243
0.356563	0.0062	2.27E+00	7.27E-05	2.27E+00	0.356552
0.427875	0.0082	2.68E+00	9.59E-05	2.68E+00	0.427859
0.499188	0.0107	3.16E+00	1.23E-04	3.16E+00	0.499165
0.5705	0.0139	3.72E+00	1.55E-04	3.72E+00	0.570469
0.641813	0.0179	4.38E+00	1.93E-04	4.38E+00	0.641772
0.713126	0.0228	5.17E+00	2.38E-04	5.17E+00	0.713073
0.784438	0.0287	6.09E+00	2.91E-04	6.09E+00	0.784372
0.855751	0.0359	7.17E+00	3.53E-04	7.17E+00	0.855668
0.927063	0.0446	8.45E+00	4.26E-04	8.45E+00	0.926961
0.998376	0.0548	9.96E+00	5.12E-04	9.96E+00	0.99825
1.069688	0.0668	1.17E+01	6.14E-04	1.17E+01	1.069535
1.141001	0.0808	1.38E+01	7.33E-04	1.38E+01	1.140815
1.212314	0.0968	1.63E+01	8.75E-04	1.63E+01	1.212089
1.283626	0.1151	1.92E+01	1.04E-03	1.92E+01	1.283356
1.354939	0.1357	2.26E+01	1.24E-03	2.26E+01	1.354615
1.426251	0.1587	2.67E+01	1.47E-03	2.67E+01	1.425865
1.497564	0.1841	3.14E+01	1.74E-03	3.14E+01	1.497103
1.568876	0.2119	3.71E+01	2.06E-03	3.70E+01	1.568328
1.640189	0.2420	4.37E+01	2.44E-03	4.36E+01	1.639538
1.711501	0.2743	5.15E+01	2.88E-03	5.14E+01	1.710729
1.782814	0.3085	6.06E+01	3.41E-03	6.05E+01	1.781898
1.854127	0.3446	7.15E+01	4.03E-03	7.13E+01	1.853042
1.925439	0.3821	8.42E+01	4.76E-03	8.40E+01	1.924155
1.996752	0.4207	9.93E+01	5.61E-03	9.89E+01	1.995234
2.068064	0.4602	1.17E+02	6.63E-03	1.16E+02	2.06627
2.139377	0.5000	1.38E+02	7.82E-03	1.37E+02	2.137258
2.210689	0.5398	1.62E+02	9.23E-03	1.62E+02	2.208188
2.282002	0.5793	1.91E+02	1.09E-02	1.90E+02	2.27905
2.353314	0.6179	2.26E+02	1.28E-02	2.24E+02	2.349833
2.424627	0.6554	2.66E+02	1.51E-02	2.63E+02	2.420521
2.49594	0.6915	3.13E+02	1.78E-02	3.10E+02	2.4911

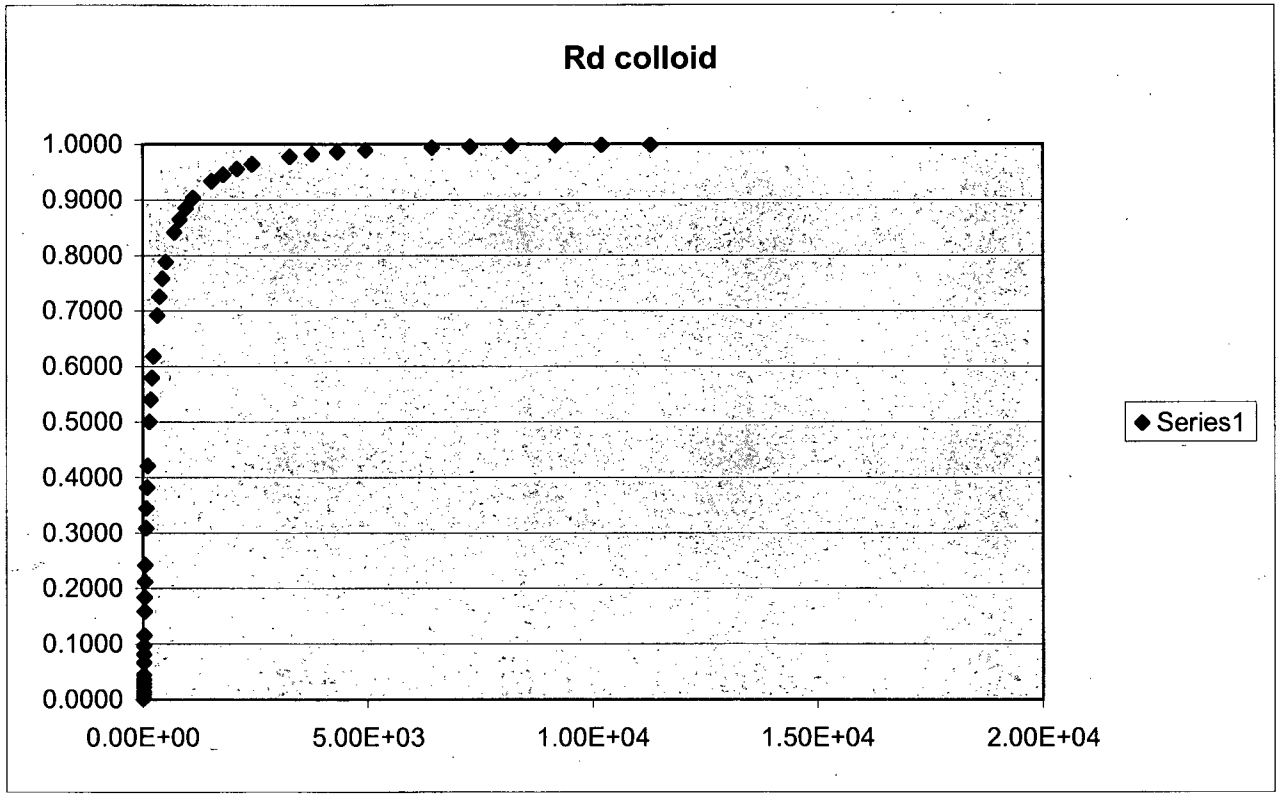
Rd,eff	cumul prob
1.00E+00	0.0013
1.18E+00	0.0019
1.39E+00	0.0026
1.64E+00	0.0035
2.27E+00	0.0062
2.68E+00	0.0082
3.16E+00	0.0107
3.72E+00	0.0139
5.17E+00	0.0228
6.09E+00	0.0287
7.17E+00	0.0359
8.45E+00	0.0446
1.17E+01	0.0668
1.38E+01	0.0808
1.63E+01	0.0968
1.92E+01	0.1151
2.67E+01	0.1587
3.14E+01	0.1841
3.70E+01	0.2119
4.36E+01	0.2420
6.05E+01	0.3085
7.13E+01	0.3446
8.40E+01	0.3821
9.89E+01	0.4207
1.37E+02	0.5000
1.62E+02	0.5398
1.90E+02	0.5793
2.24E+02	0.6179
3.10E+02	0.6915
3.64E+02	0.7257
4.28E+02	0.7580
5.03E+02	0.7881
6.94E+02	0.8413
8.15E+02	0.8643
9.55E+02	0.8849
1.12E+03	0.9032

2.567252	0.7257	3.69E+02	2.10E-02	3.64E+02	2.561549	1.53E+03	0.9332
2.638565	0.7580	4.35E+02	2.48E-02	4.28E+02	2.631846	1.78E+03	0.9452
2.709877	0.7881	5.13E+02	2.92E-02	5.03E+02	2.701965	2.08E+03	0.9554
2.78119	0.8159	6.04E+02	3.45E-02	5.91E+02	2.771875	2.42E+03	0.9641
2.852502	0.8413	7.12E+02	4.06E-02	6.94E+02	2.841541	3.25E+03	0.9772
2.923815	0.8643	8.39E+02	4.79E-02	8.15E+02	2.910921	3.75E+03	0.9821
2.995128	0.8849	9.89E+02	5.64E-02	9.55E+02	2.979967	4.31E+03	0.9861
3.06644	0.9032	1.17E+03	6.65E-02	1.12E+03	3.048623	4.95E+03	0.9893
3.137753	0.9192	1.37E+03	7.84E-02	1.31E+03	3.116827	6.43E+03	0.9938
3.209065	0.9332	1.62E+03	9.24E-02	1.53E+03	3.184503	7.27E+03	0.9953
3.280378	0.9452	1.91E+03	1.09E-01	1.78E+03	3.25157	8.19E+03	0.9965
3.35169	0.9554	2.25E+03	1.28E-01	2.08E+03	3.317932	9.17E+03	0.9974
3.423003	0.9641	2.65E+03	1.51E-01	2.42E+03	3.383481	1.02E+04	0.9981
3.494315	0.9713	3.12E+03	1.78E-01	2.81E+03	3.448099	1.13E+04	0.9987
3.565628	0.9772	3.68E+03	2.10E-01	3.25E+03	3.511653		
3.636941	0.9821	4.33E+03	2.48E-01	3.75E+03	3.573996		
3.708253	0.9861	5.11E+03	2.92E-01	4.31E+03	3.634971		
3.779566	0.9893	6.02E+03	3.44E-01	4.95E+03	3.694409		
3.850878	0.9918	7.09E+03	4.05E-01	5.65E+03	3.752132		
3.922191	0.9938	8.36E+03	4.78E-01	6.43E+03	3.807958		
3.993503	0.9953	9.85E+03	5.63E-01	7.27E+03	3.861702		
4.064816	0.9965	1.16E+04	6.63E-01	8.19E+03	3.913183		
4.136128	0.9974	1.37E+04	7.82E-01	9.17E+03	3.962232		
4.207441	0.9981	1.61E+04	9.21E-01	1.02E+04	4.008694		
4.278754	0.9987	1.90E+04	1.09E+00	1.13E+04	4.052436		


log Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Series1


log Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Series1

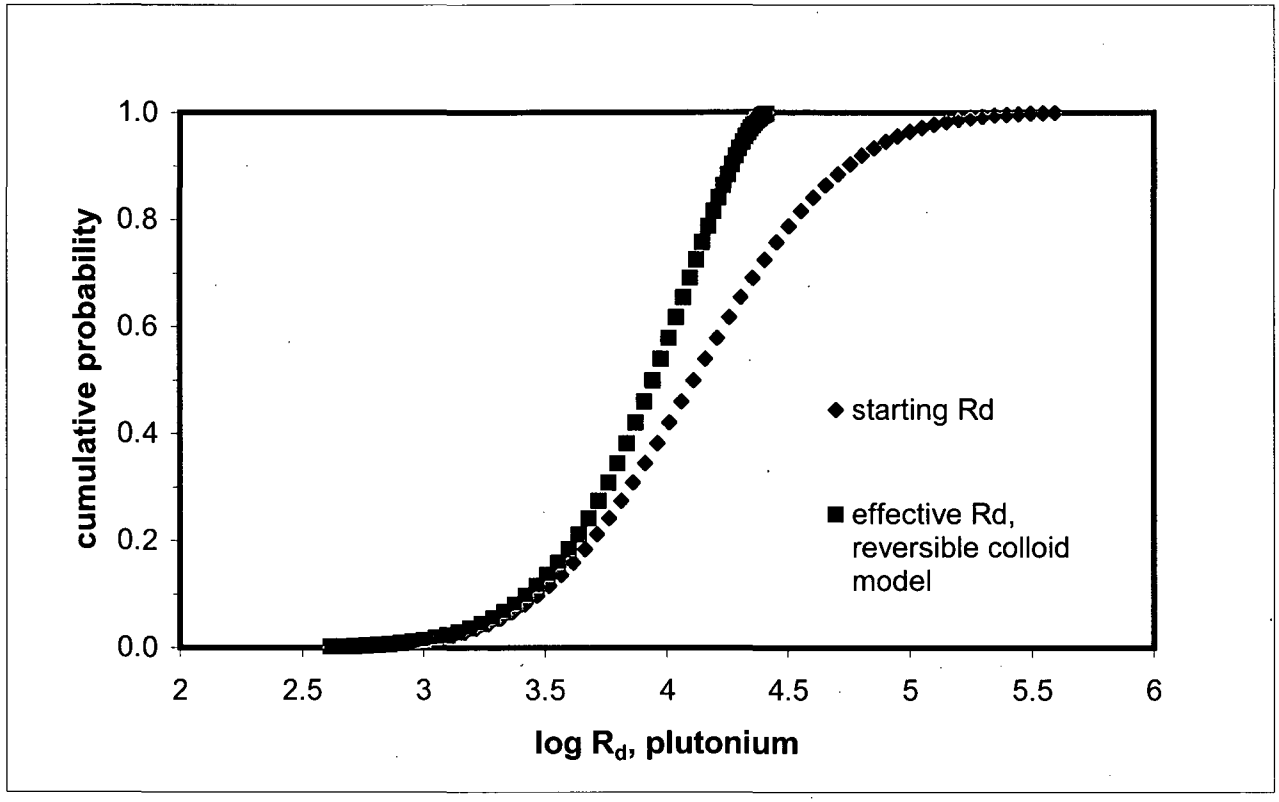

Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
Series1

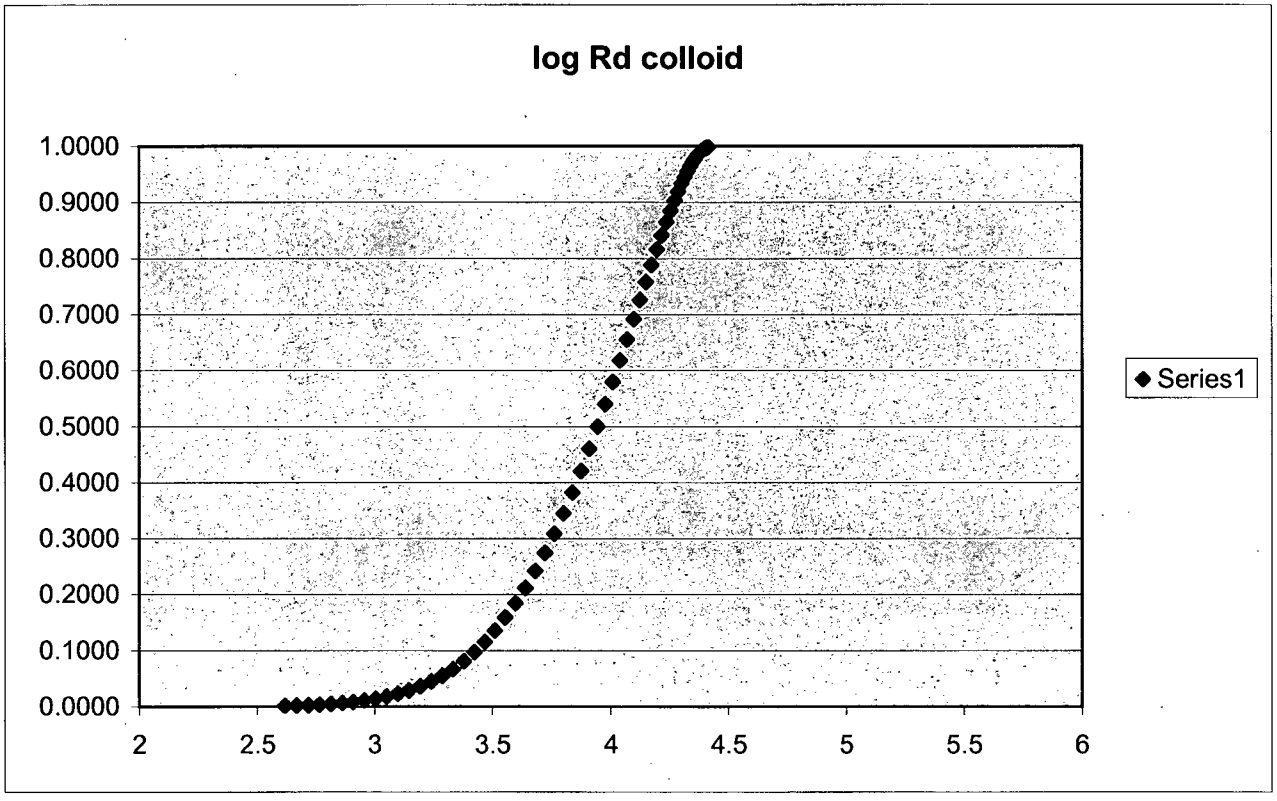

Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
Series1

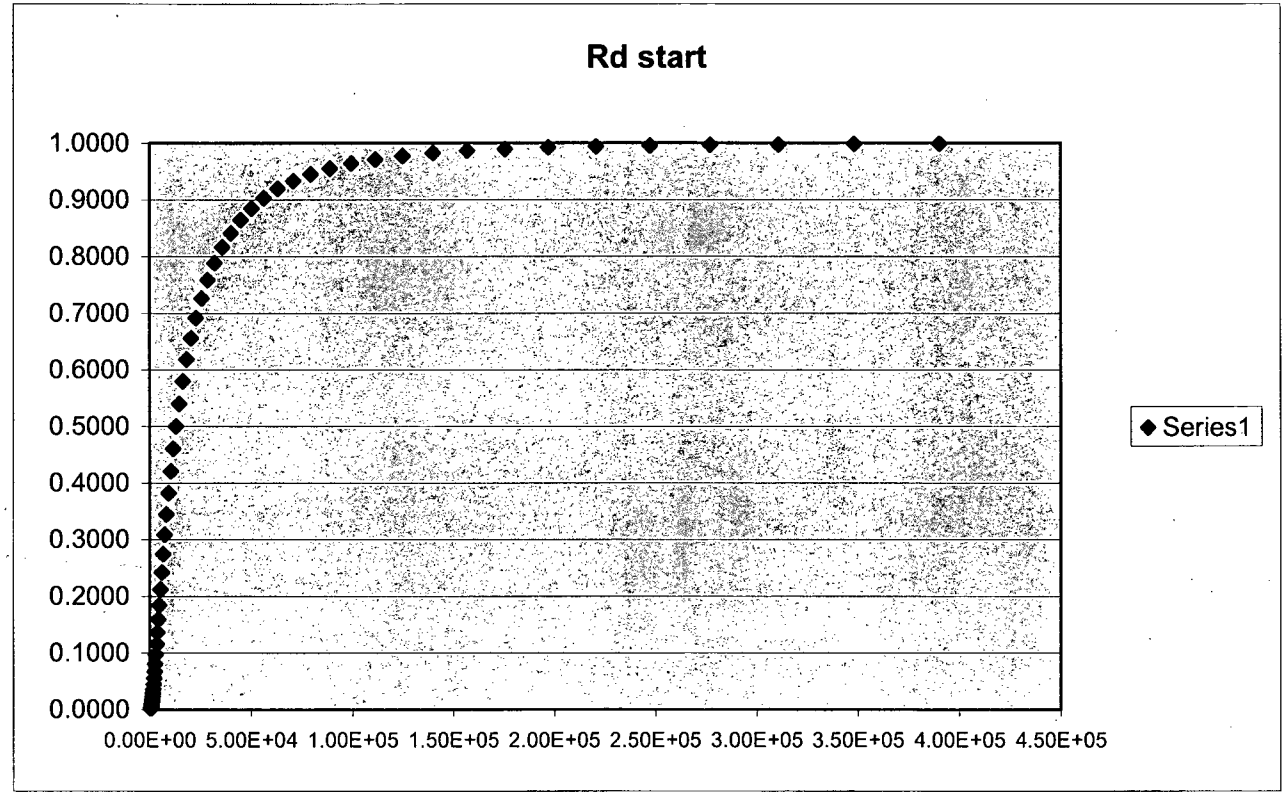
log min	log max
2.623249	5.591065
mean	sigma
4.107157	0.494636

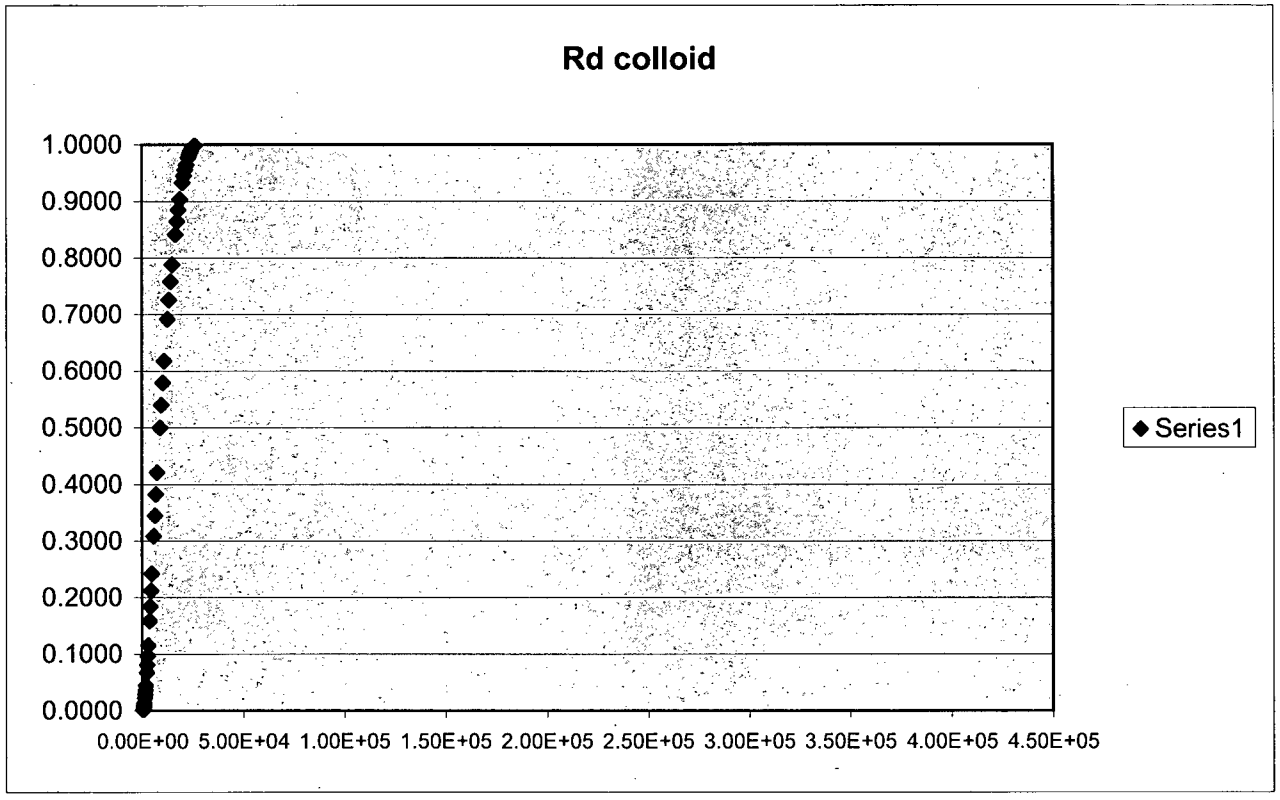
x	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
2.623249	0.0013	4.20E+02	2.39E-02	4.14E+02	2.616763	4.14E+02	0.0013
2.672713	0.0019	4.71E+02	2.68E-02	4.63E+02	2.665447	4.63E+02	0.0019
2.722176	0.0026	5.27E+02	3.01E-02	5.18E+02	2.714038	5.18E+02	0.0026
2.77164	0.0035	5.91E+02	3.37E-02	5.79E+02	2.762527	5.79E+02	0.0035
2.821104	0.0047	6.62E+02	3.78E-02	6.47E+02	2.8109	7.23E+02	0.0062
2.870567	0.0062	7.42E+02	4.24E-02	7.23E+02	2.859145	8.08E+02	0.0082
2.920031	0.0082	8.32E+02	4.75E-02	8.08E+02	2.907247	9.02E+02	0.0107
2.969494	0.0107	9.32E+02	5.32E-02	9.02E+02	2.95519	1.01E+03	0.0139
3.018958	0.0139	1.04E+03	5.96E-02	1.01E+03	3.002956	1.25E+03	0.0228
3.068422	0.0179	1.17E+03	6.68E-02	1.12E+03	3.050525	1.40E+03	0.0287
3.117885	0.0228	1.31E+03	7.49E-02	1.25E+03	3.097875	1.56E+03	0.0359
3.167349	0.0287	1.47E+03	8.39E-02	1.40E+03	3.144982	1.73E+03	0.0446
3.216812	0.0359	1.65E+03	9.41E-02	1.56E+03	3.19182	2.14E+03	0.0668
3.266276	0.0446	1.85E+03	1.05E-01	1.73E+03	3.238361	2.38E+03	0.0808
3.31574	0.0548	2.07E+03	1.18E-01	1.93E+03	3.284571	2.64E+03	0.0968
3.365203	0.0668	2.32E+03	1.32E-01	2.14E+03	3.330418	2.92E+03	0.1151
3.414667	0.0808	2.60E+03	1.48E-01	2.38E+03	3.375864	3.57E+03	0.1587
3.46413	0.0968	2.91E+03	1.66E-01	2.64E+03	3.42087	3.94E+03	0.1841
3.513594	0.1151	3.26E+03	1.86E-01	2.92E+03	3.465391	4.34E+03	0.2119
3.563057	0.1357	3.66E+03	2.09E-01	3.23E+03	3.509382	4.78E+03	0.2420
3.612521	0.1587	4.10E+03	2.34E-01	3.57E+03	3.552794	5.74E+03	0.3085
3.661985	0.1841	4.59E+03	2.62E-01	3.94E+03	3.595574	6.28E+03	0.3446
3.711448	0.2119	5.15E+03	2.94E-01	4.34E+03	3.637668	6.85E+03	0.3821
3.760912	0.2420	5.77E+03	3.29E-01	4.78E+03	3.67902	7.46E+03	0.4207
3.810375	0.2743	6.46E+03	3.69E-01	5.24E+03	3.719569	8.76E+03	0.5000
3.859839	0.3085	7.24E+03	4.14E-01	5.74E+03	3.759255	9.46E+03	0.5398
3.909303	0.3446	8.12E+03	4.64E-01	6.28E+03	3.798018	1.02E+04	0.5793
3.958766	0.3821	9.09E+03	5.20E-01	6.85E+03	3.835794	1.09E+04	0.6179
4.00823	0.4207	1.02E+04	5.82E-01	7.46E+03	3.872524	1.25E+04	0.6915
4.057693	0.4602	1.14E+04	6.53E-01	8.09E+03	3.908148	1.33E+04	0.7257
4.107157	0.5000	1.28E+04	7.31E-01	8.76E+03	3.942609	1.40E+04	0.7580
4.156621	0.5398	1.43E+04	8.20E-01	9.46E+03	3.975854	1.48E+04	0.7881
4.206084	0.5793	1.61E+04	9.18E-01	1.02E+04	4.007835	1.64E+04	0.8413
4.255548	0.6179	1.80E+04	1.03E+00	1.09E+04	4.038507	1.71E+04	0.8643
4.305011	0.6554	2.02E+04	1.15E+00	1.17E+04	4.067837	1.79E+04	0.8849
4.354475	0.6915	2.26E+04	1.29E+00	1.25E+04	4.095793	1.86E+04	0.9032

4.403938	0.7257	2.53E+04	1.45E+00	1.33E+04	4.122357	1.99E+04	0.9332
4.453402	0.7580	2.84E+04	1.62E+00	1.40E+04	4.147516	2.06E+04	0.9452
4.502866	0.7881	3.18E+04	1.82E+00	1.48E+04	4.171268	2.12E+04	0.9554
4.552329	0.8159	3.57E+04	2.04E+00	1.56E+04	4.193618	2.17E+04	0.9641
4.601793	0.8413	4.00E+04	2.28E+00	1.64E+04	4.214583	2.27E+04	0.9772
4.651256	0.8643	4.48E+04	2.56E+00	1.71E+04	4.234185	2.32E+04	0.9821
4.70072	0.8849	5.02E+04	2.87E+00	1.79E+04	4.252457	2.36E+04	0.9861
4.750184	0.9032	5.63E+04	3.21E+00	1.86E+04	4.269438	2.40E+04	0.9893
4.799647	0.9192	6.30E+04	3.60E+00	1.93E+04	4.285173	2.47E+04	0.9938
4.849111	0.9332	7.06E+04	4.04E+00	1.99E+04	4.299712	2.50E+04	0.9953
4.898574	0.9452	7.92E+04	4.52E+00	2.06E+04	4.31311	2.52E+04	0.9965
4.948038	0.9554	8.87E+04	5.07E+00	2.12E+04	4.325425	2.55E+04	0.9974
4.997502	0.9641	9.94E+04	5.68E+00	2.17E+04	4.336717	2.57E+04	0.9981
5.046965	0.9713	1.11E+05	6.37E+00	2.22E+04	4.347048	2.59E+04	0.9987
5.096429	0.9772	1.25E+05	7.13E+00	2.27E+04	4.356478		
5.145892	0.9821	1.40E+05	8.00E+00	2.32E+04	4.36507		
5.195356	0.9861	1.57E+05	8.96E+00	2.36E+04	4.372884		
5.244819	0.9893	1.76E+05	1.00E+01	2.40E+04	4.379977		
5.294283	0.9918	1.97E+05	1.13E+01	2.43E+04	4.386405		
5.343747	0.9938	2.21E+05	1.26E+01	2.47E+04	4.392223		
5.39321	0.9953	2.47E+05	1.41E+01	2.50E+04	4.397482		
5.442674	0.9965	2.77E+05	1.58E+01	2.52E+04	4.402229		
5.492137	0.9974	3.11E+05	1.77E+01	2.55E+04	4.406509		
5.541601	0.9981	3.48E+05	1.99E+01	2.57E+04	4.410364		
5.591065	0.9987	3.90E+05	2.23E+01	2.59E+04	4.413833		


1.0
0.8
0.6
0.4
0.2
0.0
cumulative probability
2
2.5
3
3.5
4
4.5
5
5.5
6
log Rd, plutonium
starting Rd
effective Rd, reversible colloid model


log Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
2
2.5
3
3.5
4
4.5
5
5.5
6
Series1

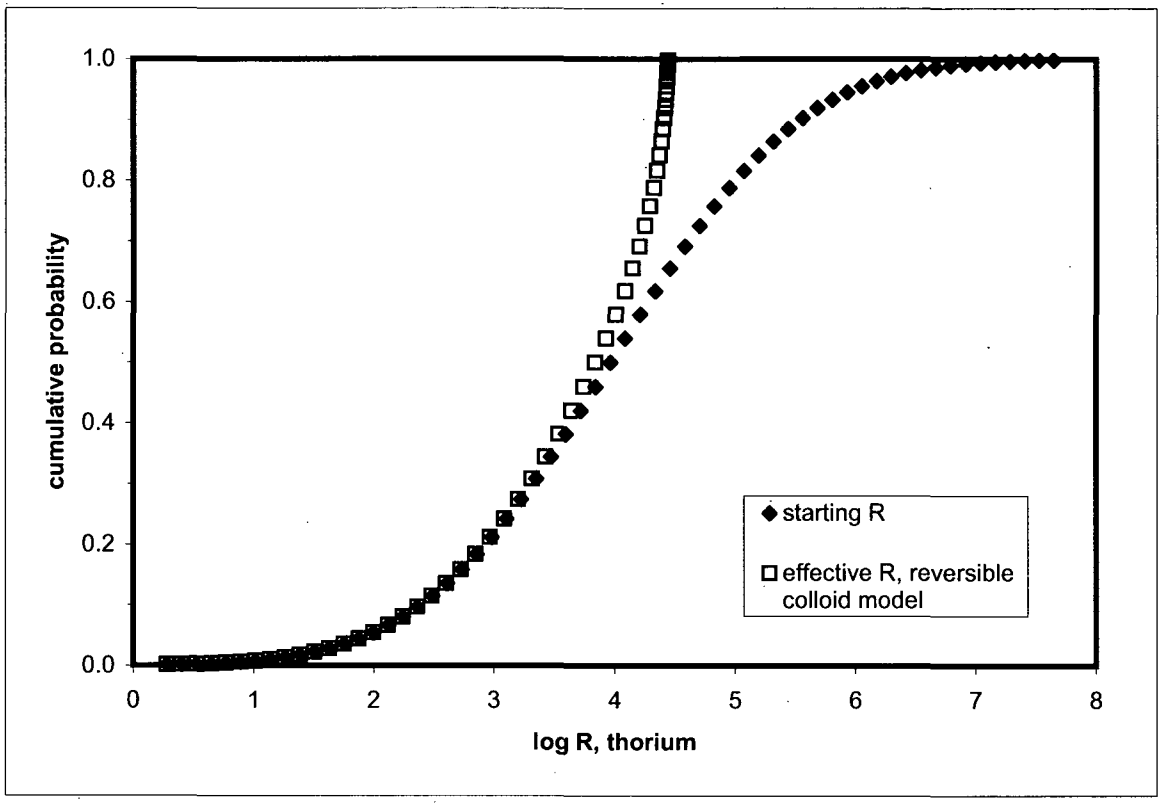

Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+04
1.00E+05
1.50E+05
2.00E+05
2.50E+05
3.00E+05
3.50E+05
4.00E+05
4.50E+05
Series1

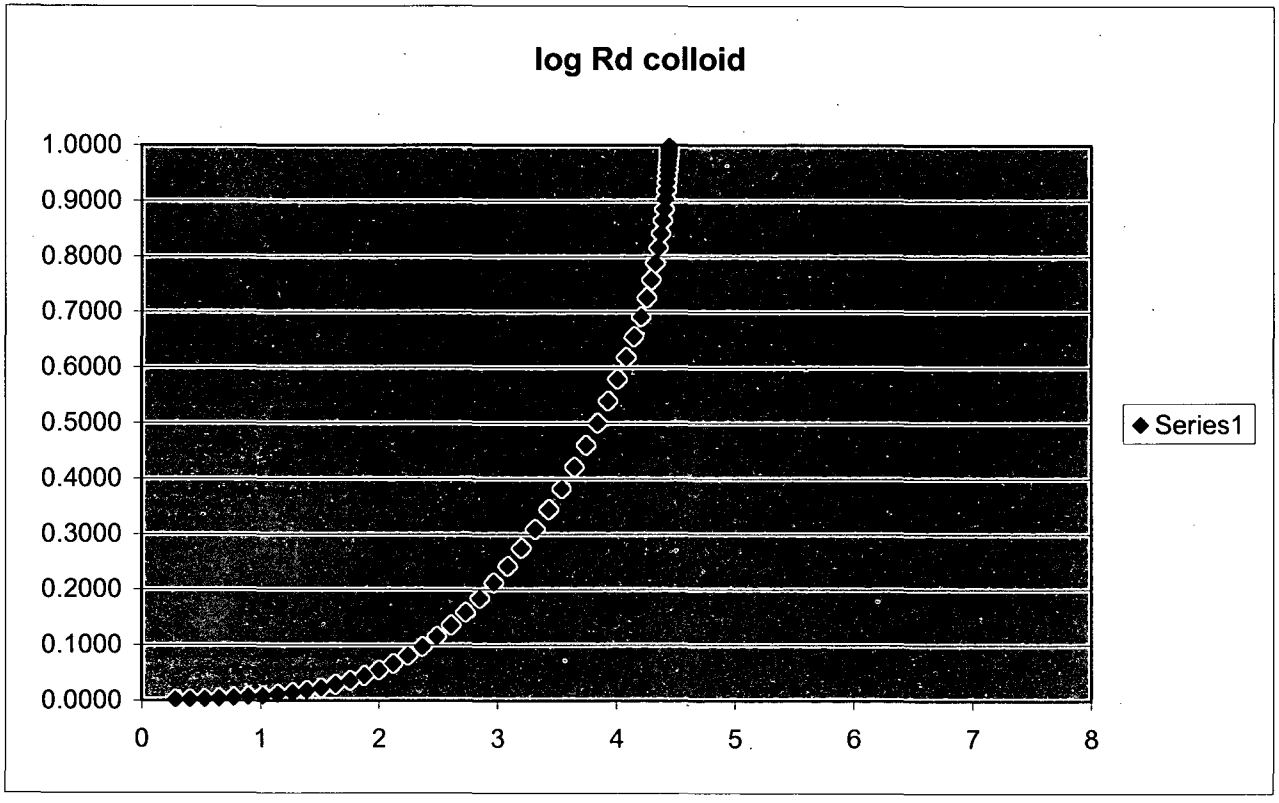

Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+04
1.00E+05
1.50E+05
2.00E+05
2.50E+05
3.00E+05
3.50E+05
4.00E+05
4.50E+05
Series1

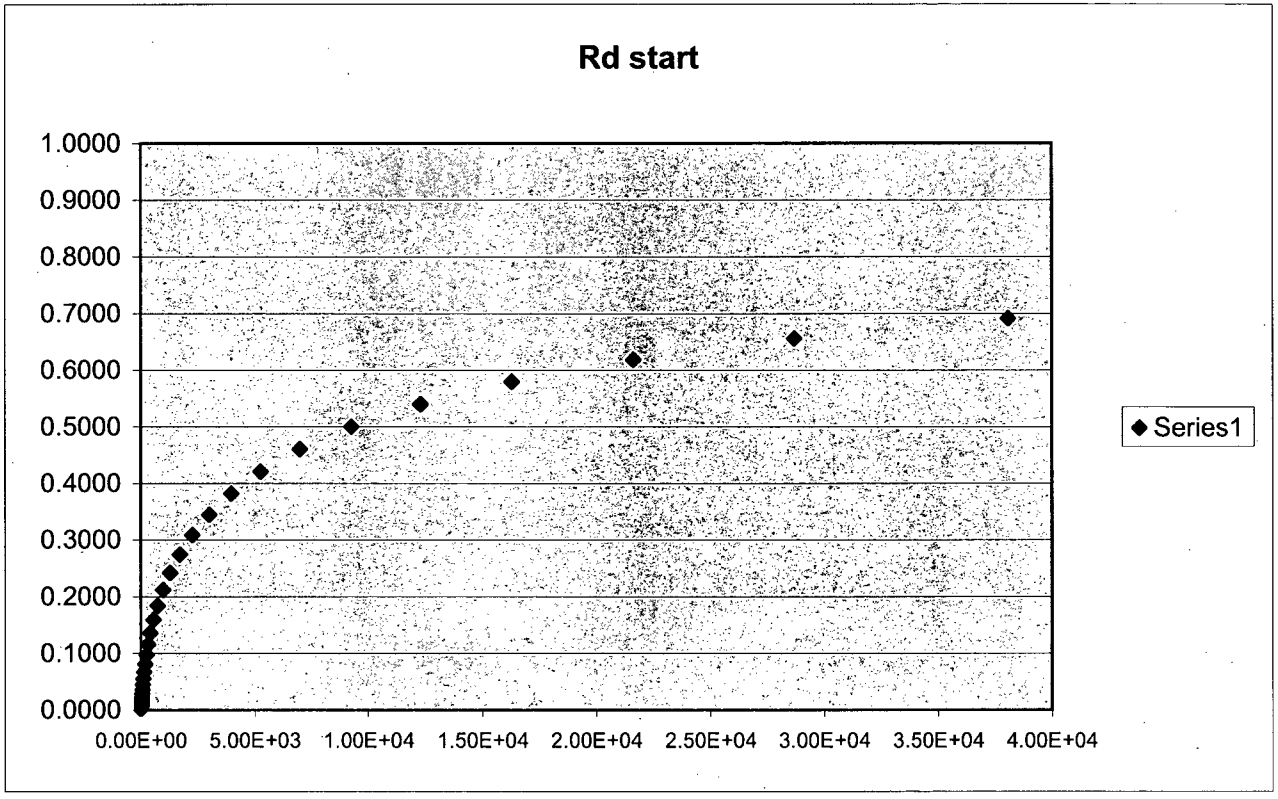
log min	log max
0.278754	7.653213
mean	sigma
3.965983	1.229076

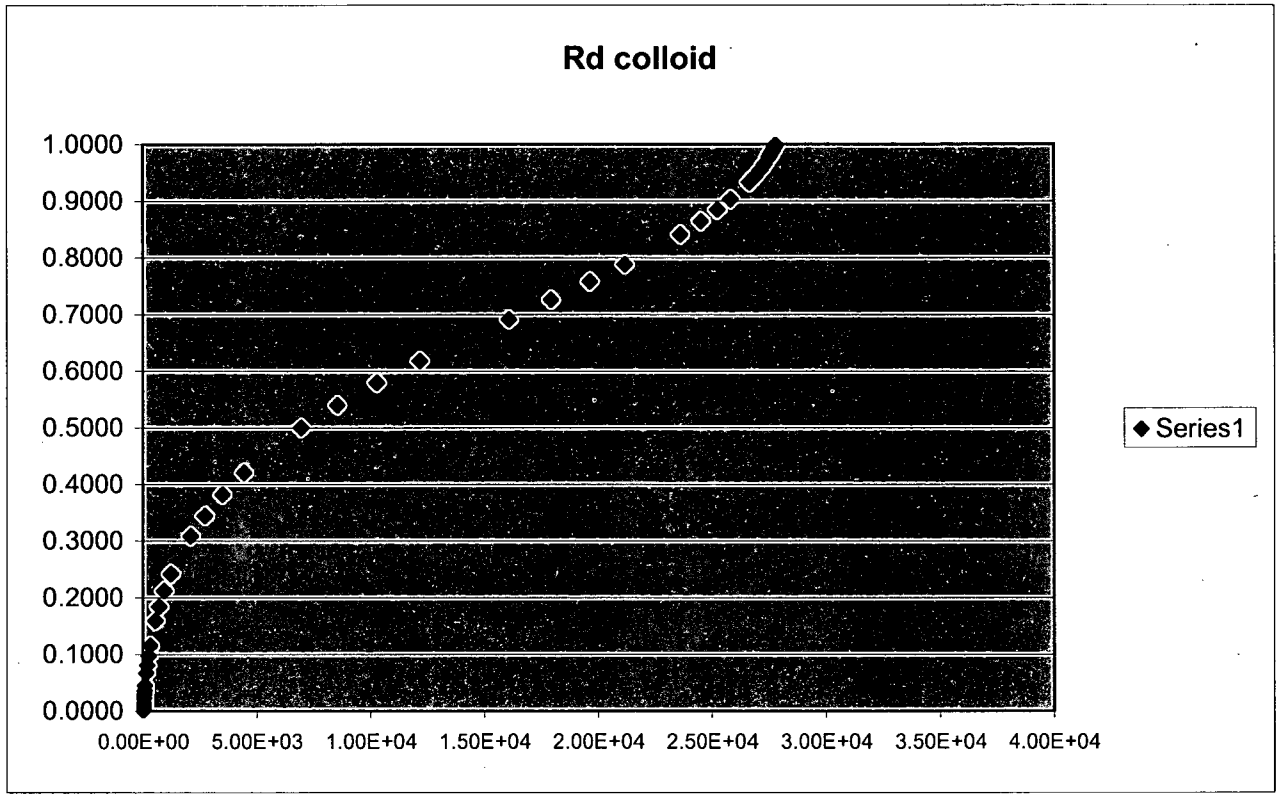
x	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
0.278754	0.0013	1.90E+00	5.14E-05	1.90E+00	0.278747	1.90E+00	0.0013
0.401661	0.0019	2.52E+00	8.69E-05	2.52E+00	0.401647	2.52E+00	0.0019
0.524569	0.0026	3.35E+00	1.34E-04	3.35E+00	0.524543	3.35E+00	0.0026
0.647477	0.0035	4.44E+00	1.97E-04	4.44E+00	0.647435	4.44E+00	0.0035
0.770384	0.0047	5.89E+00	2.80E-04	5.89E+00	0.770321	7.82E+00	0.0062
0.893292	0.0062	7.82E+00	3.90E-04	7.82E+00	0.893199	1.04E+01	0.0082
1.016199	0.0082	1.04E+01	5.36E-04	1.04E+01	1.016067	1.38E+01	0.0107
1.139107	0.0107	1.38E+01	7.30E-04	1.38E+01	1.138922	1.83E+01	0.0139
1.262015	0.0139	1.83E+01	9.88E-04	1.83E+01	1.261759	3.22E+01	0.0228
1.384922	0.0179	2.43E+01	1.33E-03	2.42E+01	1.384574	4.27E+01	0.0287
1.50783	0.0228	3.22E+01	1.78E-03	3.22E+01	1.507358	5.66E+01	0.0359
1.630738	0.0287	4.27E+01	2.38E-03	4.27E+01	1.630101	7.51E+01	0.0446
1.753645	0.0359	5.67E+01	3.18E-03	5.66E+01	1.752791	1.32E+02	0.0668
1.876553	0.0446	7.53E+01	4.24E-03	7.51E+01	1.875409	1.75E+02	0.0808
1.999461	0.0548	9.99E+01	5.65E-03	9.95E+01	1.997933	2.32E+02	0.0968
2.122368	0.0668	1.33E+02	7.52E-03	1.32E+02	2.120332	3.06E+02	0.1151
2.245276	0.0808	1.76E+02	9.99E-03	1.75E+02	2.242566	5.35E+02	0.1587
2.368184	0.0968	2.33E+02	1.33E-02	2.32E+02	2.36458	7.06E+02	0.1841
2.491091	0.1151	3.10E+02	1.76E-02	3.06E+02	2.486305	9.29E+02	0.2119
2.613999	0.1357	4.11E+02	2.34E-02	4.05E+02	2.607649	1.22E+03	0.2420
2.736907	0.1587	5.46E+02	3.11E-02	5.35E+02	2.728489	2.08E+03	0.3085
2.859814	0.1841	7.24E+02	4.13E-02	7.06E+02	2.848669	2.69E+03	0.3446
2.982722	0.2119	9.61E+02	5.49E-02	9.29E+02	2.967982	3.46E+03	0.3821
3.10563	0.2420	1.28E+03	7.28E-02	1.22E+03	3.086165	4.42E+03	0.4207
3.228537	0.2743	1.69E+03	9.67E-02	1.60E+03	3.20288	6.94E+03	0.5000
3.351445	0.3085	2.25E+03	1.28E-01	2.08E+03	3.317704	8.51E+03	0.5398
3.474352	0.3446	2.98E+03	1.70E-01	2.69E+03	3.430112	1.03E+04	0.5793
3.59726	0.3821	3.96E+03	2.26E-01	3.46E+03	3.539465	1.22E+04	0.6179
3.720168	0.4207	5.25E+03	3.00E-01	4.42E+03	3.645013	1.61E+04	0.6915
3.843075	0.4602	6.97E+03	3.98E-01	5.57E+03	3.745906	1.79E+04	0.7257
3.965983	0.5000	9.25E+03	5.28E-01	6.94E+03	3.84122	1.96E+04	0.7580
4.088891	0.5398	1.23E+04	7.01E-01	8.51E+03	3.930022	2.12E+04	0.7881
4.211798	0.5793	1.63E+04	9.31E-01	1.03E+04	4.011446	2.36E+04	0.8413
4.334706	0.6179	2.16E+04	1.23E+00	1.22E+04	4.084786	2.45E+04	0.8643
4.457614	0.6554	2.87E+04	1.64E+00	1.41E+04	4.149593	2.52E+04	0.8849
4.580521	0.6915	3.81E+04	2.18E+00	1.61E+04	4.205736	2.58E+04	0.9032

4.703429	0.7257	5.05E+04	2.89E+00	1.79E+04	4.25342	2.66E+04	0.9332
4.826337	0.7580	6.70E+04	3.83E+00	1.96E+04	4.293163	2.69E+04	0.9452
4.949244	0.7881	8.90E+04	5.08E+00	2.12E+04	4.325712	2.71E+04	0.9554
5.072152	0.8159	1.18E+05	6.75E+00	2.25E+04	4.351958	2.73E+04	0.9641
5.19506	0.8413	1.57E+05	8.95E+00	2.36E+04	4.372839	2.75E+04	0.9772
5.317967	0.8643	2.08E+05	1.19E+01	2.45E+04	4.389264	2.76E+04	0.9821
5.440875	0.8849	2.76E+05	1.58E+01	2.52E+04	4.402065	2.76E+04	0.9861
5.563782	0.9032	3.66E+05	2.09E+01	2.58E+04	4.411965	2.77E+04	0.9893
5.68669	0.9192	4.86E+05	2.78E+01	2.63E+04	4.419578	2.77E+04	0.9938
5.809598	0.9332	6.45E+05	3.69E+01	2.66E+04	4.425403	2.77E+04	0.9953
5.932505	0.9452	8.56E+05	4.89E+01	2.69E+04	4.429845	2.77E+04	0.9965
6.055413	0.9554	1.14E+06	6.49E+01	2.71E+04	4.433223	2.77E+04	0.9974
6.178321	0.9641	1.51E+06	8.62E+01	2.73E+04	4.435785	2.78E+04	0.9981
6.301228	0.9713	2.00E+06	1.14E+02	2.74E+04	4.437726	2.78E+04	0.9987
6.424136	0.9772	2.66E+06	1.52E+02	2.75E+04	4.439194		
6.547044	0.9821	3.52E+06	2.01E+02	2.76E+04	4.440303		
6.669951	0.9861	4.68E+06	2.67E+02	2.76E+04	4.441141		
6.792859	0.9893	6.21E+06	3.55E+02	2.77E+04	4.441774		
6.915767	0.9918	8.24E+06	4.71E+02	2.77E+04	4.442251		
7.038674	0.9938	1.09E+07	6.25E+02	2.77E+04	4.442611		
7.161582	0.9953	1.45E+07	8.29E+02	2.77E+04	4.442882		
7.28449	0.9965	1.93E+07	1.10E+03	2.77E+04	4.443087		
7.407397	0.9974	2.56E+07	1.46E+03	2.77E+04	4.443241		
7.530305	0.9981	3.39E+07	1.94E+03	2.78E+04	4.443358		
7.653213	0.9987	4.50E+07	2.57E+03	2.78E+04	4.443445		


1.0
0.8
0.6
0.4
0.2
0.0
cumulative probability
0
1
2
3
4
5
6
7
8
log R, thorium
starting R
effective R, reversible colloid model

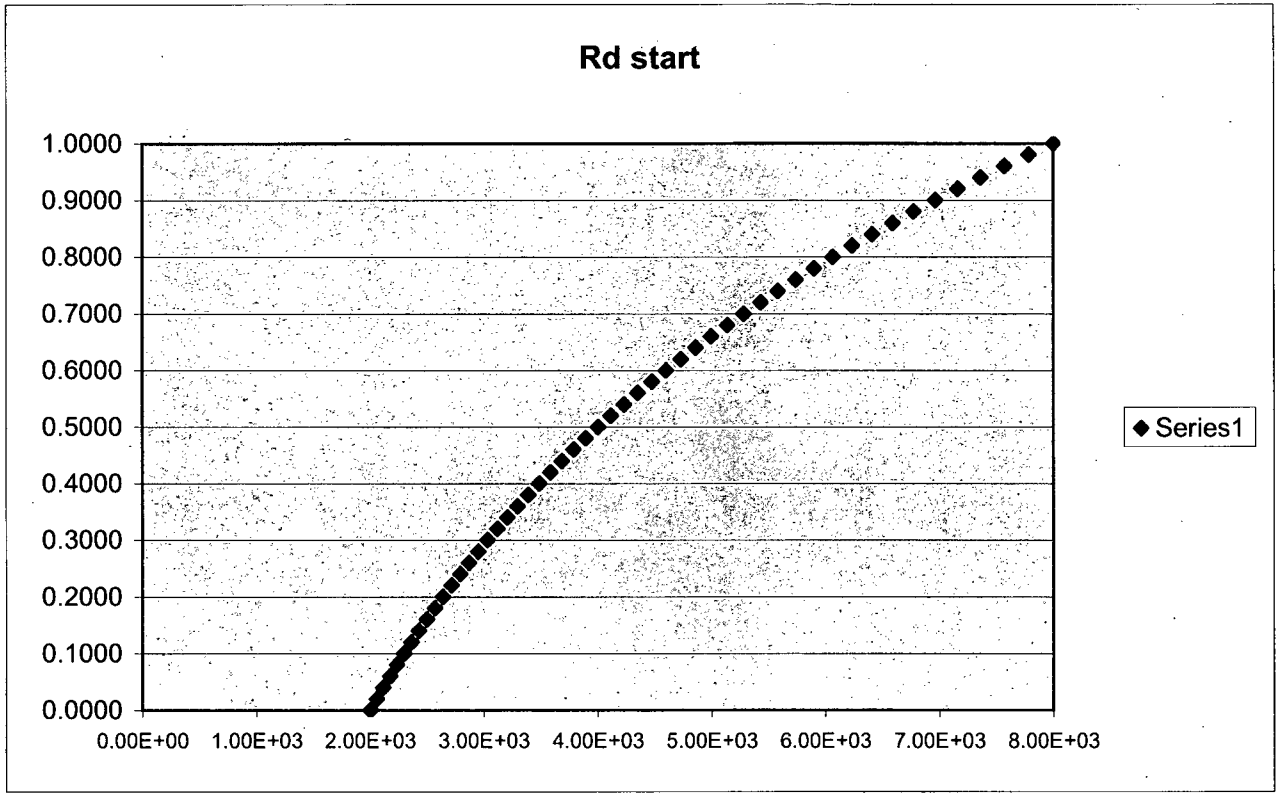

log Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0
1
2
3
4
5
6
7
8
Series1

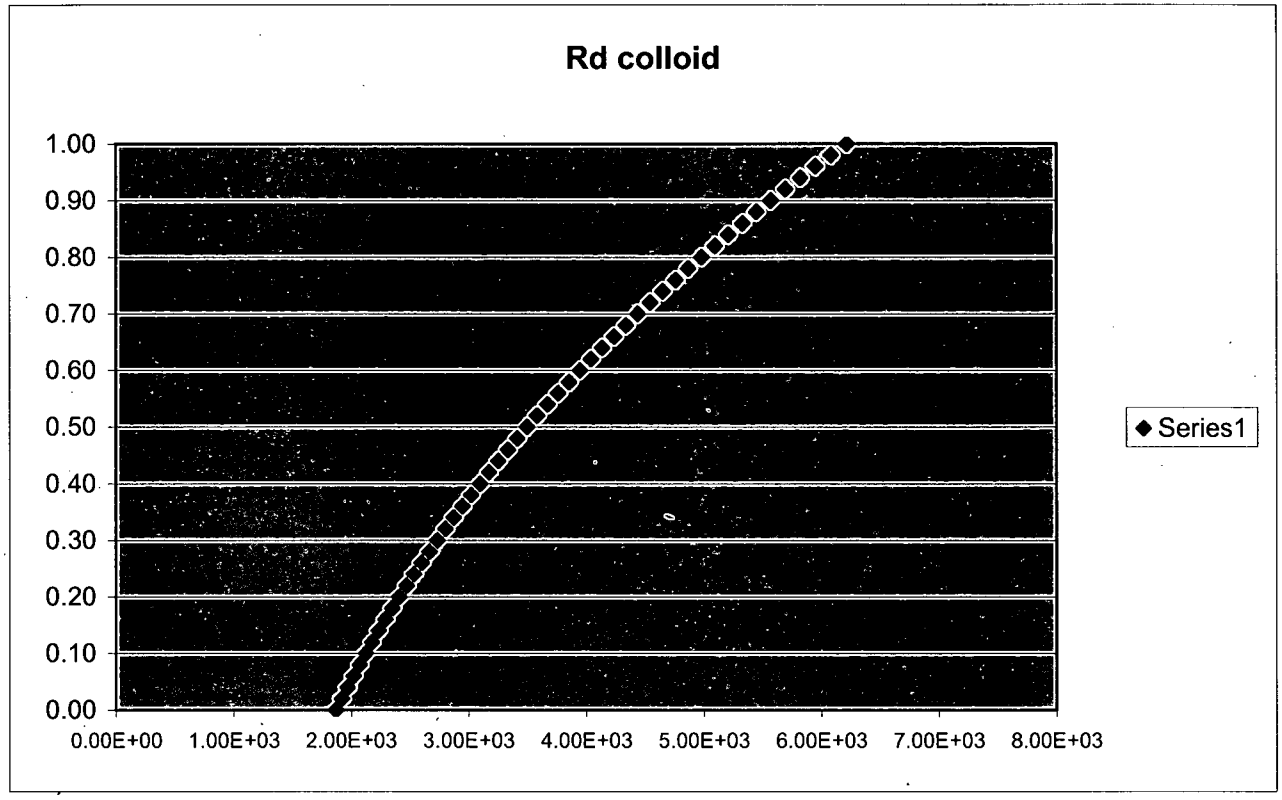

Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
2.50E+04
3.00E+04
3.50E+04
4.00E+04
Series1


Rd colloid
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
2.50E+04
3.00E+04
3.50E+04
4.00E+04
Series1

min	max	log Rd	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
3.30E+00	3.90E+00	3.30E+00	0.0000	2.00E+03	1.14E-01	1.87E+03	3.270865	1.87E+03	0.00
log-uniform		3.31E+00	0.0200	2.06E+03	1.17E-01	1.91E+03	3.282087	1.91E+03	0.02
		3.33E+00	0.0400	2.11E+03	1.21E-01	1.96E+03	3.293288	1.96E+03	0.04
		3.34E+00	0.0600	2.17E+03	1.24E-01	2.02E+03	3.304466	2.02E+03	0.06
		3.35E+00	0.0800	2.23E+03	1.28E-01	2.07E+03	3.315622	2.07E+03	0.08
		3.36E+00	0.1000	2.30E+03	1.31E-01	2.12E+03	3.326755	2.12E+03	0.10
		3.37E+00	0.1200	2.36E+03	1.35E-01	2.18E+03	3.337865	2.18E+03	0.12
		3.39E+00	0.1400	2.43E+03	1.39E-01	2.23E+03	3.34895	2.23E+03	0.14
		3.40E+00	0.1600	2.50E+03	1.43E-01	2.29E+03	3.360011	2.29E+03	0.16
		3.41E+00	0.1800	2.57E+03	1.47E-01	2.35E+03	3.371046	2.35E+03	0.18
		3.42E+00	0.2000	2.64E+03	1.51E-01	2.41E+03	3.382056	2.41E+03	0.20
		3.43E+00	0.2200	2.71E+03	1.55E-01	2.47E+03	3.393039	2.47E+03	0.22
		3.45E+00	0.2400	2.79E+03	1.59E-01	2.54E+03	3.403995	2.54E+03	0.24
		3.46E+00	0.2600	2.87E+03	1.64E-01	2.60E+03	3.414924	2.60E+03	0.26
		3.47E+00	0.2800	2.95E+03	1.68E-01	2.67E+03	3.425824	2.67E+03	0.28
		3.48E+00	0.3000	3.03E+03	1.73E-01	2.73E+03	3.436695	2.73E+03	0.30
		3.49E+00	0.3200	3.12E+03	1.78E-01	2.80E+03	3.447536	2.80E+03	0.32
		3.51E+00	0.3400	3.20E+03	1.83E-01	2.87E+03	3.458347	2.87E+03	0.34
		3.52E+00	0.3600	3.29E+03	1.88E-01	2.95E+03	3.469128	2.95E+03	0.36
		3.53E+00	0.3800	3.39E+03	1.93E-01	3.02E+03	3.479876	3.02E+03	0.38
		3.54E+00	0.4000	3.48E+03	1.99E-01	3.09E+03	3.490592	3.09E+03	0.40
		3.55E+00	0.4200	3.58E+03	2.05E-01	3.17E+03	3.501276	3.17E+03	0.42
		3.57E+00	0.4400	3.68E+03	2.10E-01	3.25E+03	3.511925	3.25E+03	0.44
		3.58E+00	0.4600	3.78E+03	2.16E-01	3.33E+03	3.52254	3.33E+03	0.46
		3.59E+00	0.4800	3.89E+03	2.22E-01	3.41E+03	3.53312	3.41E+03	0.48
		3.60E+00	0.5000	4.00E+03	2.29E-01	3.50E+03	3.543663	3.50E+03	0.50
		3.61E+00	0.5200	4.11E+03	2.35E-01	3.58E+03	3.55417	3.58E+03	0.52
		3.63E+00	0.5400	4.23E+03	2.42E-01	3.67E+03	3.56464	3.67E+03	0.54
		3.64E+00	0.5600	4.35E+03	2.48E-01	3.76E+03	3.575071	3.76E+03	0.56
		3.65E+00	0.5800	4.47E+03	2.55E-01	3.85E+03	3.585463	3.85E+03	0.58
		3.66E+00	0.6000	4.59E+03	2.63E-01	3.94E+03	3.595815	3.94E+03	0.60
		3.67E+00	0.6200	4.72E+03	2.70E-01	4.04E+03	3.606127	4.04E+03	0.62
		3.69E+00	0.6400	4.86E+03	2.77E-01	4.13E+03	3.616397	4.13E+03	0.64
		3.70E+00	0.6600	4.99E+03	2.85E-01	4.23E+03	3.626625	4.23E+03	0.66
		3.71E+00	0.6800	5.13E+03	2.93E-01	4.33E+03	3.63681	4.33E+03	0.68
		3.72E+00	0.7000	5.28E+03	3.02E-01	4.44E+03	3.64695	4.44E+03	0.70

3.73E+00	0.7200	5.43E+03	3.10E-01	4.54E+03	3.657046	4.54E+03	0.72
3.75E+00	0.7400	5.58E+03	3.19E-01	4.65E+03	3.667097	4.65E+03	0.74
3.76E+00	0.7600	5.74E+03	3.28E-01	4.75E+03	3.677101	4.75E+03	0.76
3.77E+00	0.7800	5.90E+03	3.37E-01	4.86E+03	3.687057	4.86E+03	0.78
3.78E+00	0.8000	6.06E+03	3.46E-01	4.98E+03	3.696965	4.98E+03	0.80
3.79E+00	0.8200	6.23E+03	3.56E-01	5.09E+03	3.706824	5.09E+03	0.82
3.81E+00	0.8400	6.41E+03	3.66E-01	5.21E+03	3.716634	5.21E+03	0.84
3.82E+00	0.8600	6.59E+03	3.76E-01	5.33E+03	3.726392	5.33E+03	0.86
3.83E+00	0.8800	6.77E+03	3.87E-01	5.45E+03	3.736099	5.45E+03	0.88
3.84E+00	0.9000	6.96E+03	3.98E-01	5.57E+03	3.745753	5.57E+03	0.90
3.85E+00	0.9200	7.16E+03	4.09E-01	5.69E+03	3.755353	5.69E+03	0.92
3.87E+00	0.9400	7.36E+03	4.21E-01	5.82E+03	3.764899	5.82E+03	0.94
3.88E+00	0.9600	7.57E+03	4.32E-01	5.95E+03	3.77439	5.95E+03	0.96
3.89E+00	0.9800	7.78E+03	4.45E-01	6.08E+03	3.783824	6.08E+03	0.98
3.90E+00	1.0000	8.00E+03	4.57E-01	6.21E+03	3.793202	6.21E+03	1.00


Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
1.00E+03
2.00E+03
3.00E+03
4.00E+03
5.00E+03
6.00E+03
7.00E+03
8.00E+03
Series1


Rd colloid
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00E+00
1.00E+03
2.00E+03
3.00E+03
4.00E+03
5.00E+03
6.00E+03
7.00E+03
8.00E+03
Series1

min	max	log Rd	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
3.30E+00	3.90E+00	3.30E+00	0.0000	2.00E+03	1.14E-01	1.87E+03	3.270865	1.87E+03	0.00
log-uniform		3.31E+00	0.0200	2.06E+03	1.17E-01	1.91E+03	3.282087	1.91E+03	0.02
		3.33E+00	0.0400	2.11E+03	1.21E-01	1.96E+03	3.293288	1.96E+03	0.04
		3.34E+00	0.0600	2.17E+03	1.24E-01	2.02E+03	3.304466	2.02E+03	0.06
		3.35E+00	0.0800	2.23E+03	1.28E-01	2.07E+03	3.315622	2.07E+03	0.08
		3.36E+00	0.1000	2.30E+03	1.31E-01	2.12E+03	3.326755	2.12E+03	0.10
		3.37E+00	0.1200	2.36E+03	1.35E-01	2.18E+03	3.337865	2.18E+03	0.12
		3.39E+00	0.1400	2.43E+03	1.39E-01	2.23E+03	3.34895	2.23E+03	0.14
		3.40E+00	0.1600	2.50E+03	1.43E-01	2.29E+03	3.360011	2.29E+03	0.16
		3.41E+00	0.1800	2.57E+03	1.47E-01	2.35E+03	3.371046	2.35E+03	0.18
		3.42E+00	0.2000	2.64E+03	1.51E-01	2.41E+03	3.382056	2.41E+03	0.20
		3.43E+00	0.2200	2.71E+03	1.55E-01	2.47E+03	3.393039	2.47E+03	0.22
		3.45E+00	0.2400	2.79E+03	1.59E-01	2.54E+03	3.403995	2.54E+03	0.24
		3.46E+00	0.2600	2.87E+03	1.64E-01	2.60E+03	3.414924	2.60E+03	0.26
		3.47E+00	0.2800	2.95E+03	1.68E-01	2.67E+03	3.425824	2.67E+03	0.28
		3.48E+00	0.3000	3.03E+03	1.73E-01	2.73E+03	3.436695	2.73E+03	0.30
		3.49E+00	0.3200	3.12E+03	1.78E-01	2.80E+03	3.447536	2.80E+03	0.32
		3.51E+00	0.3400	3.20E+03	1.83E-01	2.87E+03	3.458347	2.87E+03	0.34
		3.52E+00	0.3600	3.29E+03	1.88E-01	2.95E+03	3.469128	2.95E+03	0.36
		3.53E+00	0.3800	3.39E+03	1.93E-01	3.02E+03	3.479876	3.02E+03	0.38
		3.54E+00	0.4000	3.48E+03	1.99E-01	3.09E+03	3.490592	3.09E+03	0.40
		3.55E+00	0.4200	3.58E+03	2.05E-01	3.17E+03	3.501276	3.17E+03	0.42
		3.57E+00	0.4400	3.68E+03	2.10E-01	3.25E+03	3.511925	3.25E+03	0.44
		3.58E+00	0.4600	3.78E+03	2.16E-01	3.33E+03	3.52254	3.33E+03	0.46
		3.59E+00	0.4800	3.89E+03	2.22E-01	3.41E+03	3.53312	3.41E+03	0.48
		3.60E+00	0.5000	4.00E+03	2.29E-01	3.50E+03	3.543663	3.50E+03	0.50
		3.61E+00	0.5200	4.11E+03	2.35E-01	3.58E+03	3.55417	3.58E+03	0.52
		3.63E+00	0.5400	4.23E+03	2.42E-01	3.67E+03	3.56464	3.67E+03	0.54
		3.64E+00	0.5600	4.35E+03	2.48E-01	3.76E+03	3.575071	3.76E+03	0.56
		3.65E+00	0.5800	4.47E+03	2.55E-01	3.85E+03	3.585463	3.85E+03	0.58
		3.66E+00	0.6000	4.59E+03	2.63E-01	3.94E+03	3.595815	3.94E+03	0.60
		3.67E+00	0.6200	4.72E+03	2.70E-01	4.04E+03	3.606127	4.04E+03	0.62
		3.69E+00	0.6400	4.86E+03	2.77E-01	4.13E+03	3.616397	4.13E+03	0.64
		3.70E+00	0.6600	4.99E+03	2.85E-01	4.23E+03	3.626625	4.23E+03	0.66
		3.71E+00	0.6800	5.13E+03	2.93E-01	4.33E+03	3.63681	4.33E+03	0.68
		3.72E+00	0.7000	5.28E+03	3.02E-01	4.44E+03	3.64695	4.44E+03	0.70

3.73E+00	0.7200	5.43E+03	3.10E-01	4.54E+03	3.657046	4.54E+03	0.72
3.75E+00	0.7400	5.58E+03	3.19E-01	4.65E+03	3.667097	4.65E+03	0.74
3.76E+00	0.7600	5.74E+03	3.28E-01	4.75E+03	3.677101	4.75E+03	0.76
3.77E+00	0.7800	5.90E+03	3.37E-01	4.86E+03	3.687057	4.86E+03	0.78
3.78E+00	0.8000	6.06E+03	3.46E-01	4.98E+03	3.696965	4.98E+03	0.80
3.79E+00	0.8200	6.23E+03	3.56E-01	5.09E+03	3.706824	5.09E+03	0.82
3.81E+00	0.8400	6.41E+03	3.66E-01	5.21E+03	3.716634	5.21E+03	0.84
3.82E+00	0.8600	6.59E+03	3.76E-01	5.33E+03	3.726392	5.33E+03	0.86
3.83E+00	0.8800	6.77E+03	3.87E-01	5.45E+03	3.736099	5.45E+03	0.88
3.84E+00	0.9000	6.96E+03	3.98E-01	5.57E+03	3.745753	5.57E+03	0.90
3.85E+00	0.9200	7.16E+03	4.09E-01	5.69E+03	3.755353	5.69E+03	0.92
3.87E+00	0.9400	7.36E+03	4.21E-01	5.82E+03	3.764899	5.82E+03	0.94
3.88E+00	0.9600	7.57E+03	4.32E-01	5.95E+03	3.77439	5.95E+03	0.96
3.89E+00	0.9800	7.78E+03	4.45E-01	6.08E+03	3.783824	6.08E+03	0.98
3.90E+00	1.0000	8.00E+03	4.57E-01	6.21E+03	3.793202	6.21E+03	1.00

min	max	log Rd	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
4.95E+00	5.00E+00	4.95E+00	0.0000	9.00E+04	5.14E+00	2.12E+04	4.326896	2.12E+04	0.00
log-uniform		4.96E+00	0.0200	9.02E+04	5.15E+00	2.12E+04	4.327112	2.12E+04	0.02
		4.96E+00	0.0400	9.04E+04	5.16E+00	2.12E+04	4.327327	2.12E+04	0.04
		4.96E+00	0.0600	9.06E+04	5.18E+00	2.13E+04	4.327542	2.13E+04	0.06
		4.96E+00	0.0800	9.08E+04	5.19E+00	2.13E+04	4.327757	2.13E+04	0.08
		4.96E+00	0.1000	9.10E+04	5.20E+00	2.13E+04	4.327971	2.13E+04	0.10
		4.96E+00	0.1200	9.11E+04	5.21E+00	2.13E+04	4.328185	2.13E+04	0.12
		4.96E+00	0.1400	9.13E+04	5.22E+00	2.13E+04	4.328398	2.13E+04	0.14
		4.96E+00	0.1600	9.15E+04	5.23E+00	2.13E+04	4.328612	2.13E+04	0.16
		4.96E+00	0.1800	9.17E+04	5.24E+00	2.13E+04	4.328824	2.13E+04	0.18
		4.96E+00	0.2000	9.19E+04	5.25E+00	2.13E+04	4.329037	2.13E+04	0.20
		4.96E+00	0.2200	9.21E+04	5.26E+00	2.13E+04	4.329249	2.13E+04	0.22
		4.97E+00	0.2400	9.23E+04	5.27E+00	2.14E+04	4.329461	2.14E+04	0.24
		4.97E+00	0.2600	9.25E+04	5.29E+00	2.14E+04	4.329673	2.14E+04	0.26
		4.97E+00	0.2800	9.27E+04	5.30E+00	2.14E+04	4.329884	2.14E+04	0.28
		4.97E+00	0.3000	9.29E+04	5.31E+00	2.14E+04	4.330095	2.14E+04	0.30
		4.97E+00	0.3200	9.31E+04	5.32E+00	2.14E+04	4.330305	2.14E+04	0.32
		4.97E+00	0.3400	9.33E+04	5.33E+00	2.14E+04	4.330515	2.14E+04	0.34
		4.97E+00	0.3600	9.35E+04	5.34E+00	2.14E+04	4.330725	2.14E+04	0.36
		4.97E+00	0.3800	9.37E+04	5.35E+00	2.14E+04	4.330934	2.14E+04	0.38
		4.97E+00	0.4000	9.39E+04	5.36E+00	2.14E+04	4.331144	2.14E+04	0.40
		4.97E+00	0.4200	9.41E+04	5.38E+00	2.14E+04	4.331352	2.14E+04	0.42
		4.97E+00	0.4400	9.43E+04	5.39E+00	2.15E+04	4.331561	2.15E+04	0.44
		4.98E+00	0.4600	9.45E+04	5.40E+00	2.15E+04	4.331769	2.15E+04	0.46
		4.98E+00	0.4800	9.47E+04	5.41E+00	2.15E+04	4.331977	2.15E+04	0.48
		4.98E+00	0.5000	9.49E+04	5.42E+00	2.15E+04	4.332184	2.15E+04	0.50
		4.98E+00	0.5200	9.51E+04	5.43E+00	2.15E+04	4.332391	2.15E+04	0.52
		4.98E+00	0.5400	9.53E+04	5.44E+00	2.15E+04	4.332598	2.15E+04	0.54
		4.98E+00	0.5600	9.55E+04	5.46E+00	2.15E+04	4.332804	2.15E+04	0.56
		4.98E+00	0.5800	9.57E+04	5.47E+00	2.15E+04	4.333011	2.15E+04	0.58
		4.98E+00	0.6000	9.59E+04	5.48E+00	2.15E+04	4.333216	2.15E+04	0.60
		4.98E+00	0.6200	9.61E+04	5.49E+00	2.15E+04	4.333422	2.15E+04	0.62
		4.98E+00	0.6400	9.63E+04	5.50E+00	2.16E+04	4.333627	2.16E+04	0.64
		4.98E+00	0.6600	9.65E+04	5.51E+00	2.16E+04	4.333831	2.16E+04	0.66
		4.99E+00	0.6800	9.67E+04	5.52E+00	2.16E+04	4.334036	2.16E+04	0.68
		4.99E+00	0.7000	9.69E+04	5.54E+00	2.16E+04	4.33424	2.16E+04	0.70

4.99E+00	0.7200	9.71E+04	5.55E+00	2.16E+04	4.334444	2.16E+04	0.72
4.99E+00	0.7400	9.73E+04	5.56E+00	2.16E+04	4.334647	2.16E+04	0.74
4.99E+00	0.7600	9.75E+04	5.57E+00	2.16E+04	4.33485	2.16E+04	0.76
4.99E+00	0.7800	9.77E+04	5.58E+00	2.16E+04	4.335053	2.16E+04	0.78
4.99E+00	0.8000	9.79E+04	5.60E+00	2.16E+04	4.335255	2.16E+04	0.80
4.99E+00	0.8200	9.81E+04	5.61E+00	2.16E+04	4.335457	2.16E+04	0.82
4.99E+00	0.8400	9.83E+04	5.62E+00	2.17E+04	4.335659	2.17E+04	0.84
4.99E+00	0.8600	9.85E+04	5.63E+00	2.17E+04	4.335861	2.17E+04	0.86
4.99E+00	0.8800	9.87E+04	5.64E+00	2.17E+04	4.336062	2.17E+04	0.88
5.00E+00	0.9000	9.90E+04	5.65E+00	2.17E+04	4.336262	2.17E+04	0.90
5.00E+00	0.9200	9.92E+04	5.67E+00	2.17E+04	4.336463	2.17E+04	0.92
5.00E+00	0.9400	9.94E+04	5.68E+00	2.17E+04	4.336663	2.17E+04	0.94
5.00E+00	0.9600	9.96E+04	5.69E+00	2.17E+04	4.336863	2.17E+04	0.96
5.00E+00	0.9800	9.98E+04	5.70E+00	2.17E+04	4.337062	2.17E+04	0.98
5.00E+00	1.0000	1.00E+05	5.71E+00	2.17E+04	4.337261	2.17E+04	1.00

min	max	log Rd	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
3.00E+00	3.90E+00	3.00E+00	0.0000	1.00E+03	5.71E-02	9.65E+02	2.984671	9.65E+02	0.00
log-uniform		3.02E+00	0.0200	1.04E+03	5.95E-02	1.00E+03	3.002092	1.00E+03	0.02
		3.04E+00	0.0400	1.09E+03	6.20E-02	1.05E+03	3.019488	1.05E+03	0.04
		3.05E+00	0.0600	1.13E+03	6.47E-02	1.09E+03	3.036856	1.09E+03	0.06
		3.07E+00	0.0800	1.18E+03	6.74E-02	1.13E+03	3.054195	1.13E+03	0.08
		3.09E+00	0.1000	1.23E+03	7.03E-02	1.18E+03	3.071505	1.18E+03	0.10
		3.11E+00	0.1200	1.28E+03	7.33E-02	1.23E+03	3.088785	1.23E+03	0.12
		3.13E+00	0.1400	1.34E+03	7.64E-02	1.28E+03	3.106033	1.28E+03	0.14
		3.14E+00	0.1600	1.39E+03	7.96E-02	1.33E+03	3.123248	1.33E+03	0.16
		3.16E+00	0.1800	1.45E+03	8.30E-02	1.38E+03	3.140429	1.38E+03	0.18
		3.18E+00	0.2000	1.52E+03	8.66E-02	1.44E+03	3.157575	1.44E+03	0.20
		3.20E+00	0.2200	1.58E+03	9.02E-02	1.50E+03	3.174683	1.50E+03	0.22
		3.22E+00	0.2400	1.65E+03	9.41E-02	1.56E+03	3.191754	1.56E+03	0.24
		3.23E+00	0.2600	1.72E+03	9.81E-02	1.62E+03	3.208784	1.62E+03	0.26
		3.25E+00	0.2800	1.79E+03	1.02E-01	1.68E+03	3.225774	1.68E+03	0.28
		3.27E+00	0.3000	1.87E+03	1.07E-01	1.75E+03	3.24272	1.75E+03	0.30
		3.29E+00	0.3200	1.95E+03	1.11E-01	1.82E+03	3.259623	1.82E+03	0.32
		3.31E+00	0.3400	2.03E+03	1.16E-01	1.89E+03	3.276479	1.89E+03	0.34
		3.33E+00	0.3600	2.11E+03	1.21E-01	1.96E+03	3.293288	1.96E+03	0.36
		3.34E+00	0.3800	2.20E+03	1.26E-01	2.04E+03	3.310047	2.04E+03	0.38
		3.36E+00	0.4000	2.30E+03	1.31E-01	2.12E+03	3.326755	2.12E+03	0.40
		3.38E+00	0.4200	2.39E+03	1.37E-01	2.21E+03	3.343411	2.21E+03	0.42
		3.40E+00	0.4400	2.50E+03	1.43E-01	2.29E+03	3.360011	2.29E+03	0.44
		3.42E+00	0.4600	2.60E+03	1.49E-01	2.38E+03	3.376554	2.38E+03	0.46
		3.43E+00	0.4800	2.71E+03	1.55E-01	2.47E+03	3.393039	2.47E+03	0.48
		3.45E+00	0.5000	2.83E+03	1.62E-01	2.57E+03	3.409463	2.57E+03	0.50
		3.47E+00	0.5200	2.95E+03	1.68E-01	2.67E+03	3.425824	2.67E+03	0.52
		3.49E+00	0.5400	3.07E+03	1.76E-01	2.77E+03	3.442119	2.77E+03	0.54
		3.51E+00	0.5600	3.20E+03	1.83E-01	2.87E+03	3.458347	2.87E+03	0.56
		3.52E+00	0.5800	3.34E+03	1.91E-01	2.98E+03	3.474506	2.98E+03	0.58
		3.54E+00	0.6000	3.48E+03	1.99E-01	3.09E+03	3.490592	3.09E+03	0.60
		3.56E+00	0.6200	3.63E+03	2.07E-01	3.21E+03	3.506604	3.21E+03	0.62
		3.58E+00	0.6400	3.78E+03	2.16E-01	3.33E+03	3.52254	3.33E+03	0.64
		3.60E+00	0.6600	3.94E+03	2.25E-01	3.45E+03	3.538396	3.45E+03	0.66
		3.61E+00	0.6800	4.11E+03	2.35E-01	3.58E+03	3.55417	3.58E+03	0.68
		3.63E+00	0.7000	4.29E+03	2.45E-01	3.71E+03	3.56986	3.71E+03	0.70

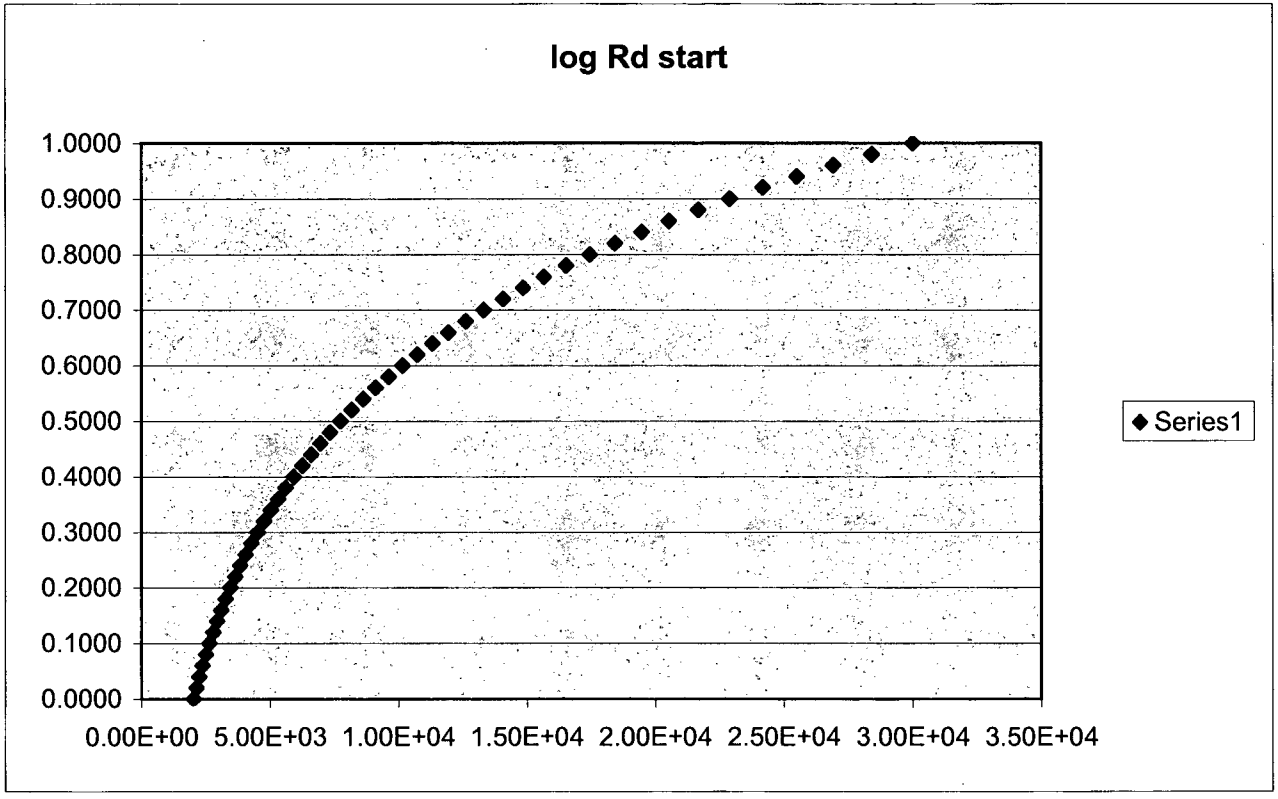
3.65E+00	0.7200	4.47E+03	2.55E-01	3.85E+03	3.585463	3.85E+03	0.72
3.67E+00	0.7400	4.66E+03	2.66E-01	3.99E+03	3.600976	3.99E+03	0.74
3.69E+00	0.7600	4.86E+03	2.77E-01	4.13E+03	3.616397	4.13E+03	0.76
3.70E+00	0.7800	5.06E+03	2.89E-01	4.28E+03	3.631723	4.28E+03	0.78
3.72E+00	0.8000	5.28E+03	3.02E-01	4.44E+03	3.64695	4.44E+03	0.80
3.74E+00	0.8200	5.50E+03	3.14E-01	4.59E+03	3.662077	4.59E+03	0.82
3.76E+00	0.8400	5.74E+03	3.28E-01	4.75E+03	3.677101	4.75E+03	0.84
3.78E+00	0.8600	5.98E+03	3.42E-01	4.92E+03	3.692017	4.92E+03	0.86
3.79E+00	0.8800	6.23E+03	3.56E-01	5.09E+03	3.706824	5.09E+03	0.88
3.81E+00	0.9000	6.50E+03	3.71E-01	5.27E+03	3.721519	5.27E+03	0.90
3.83E+00	0.9200	6.77E+03	3.87E-01	5.45E+03	3.736099	5.45E+03	0.92
3.85E+00	0.9400	7.06E+03	4.03E-01	5.63E+03	3.750559	5.63E+03	0.94
3.87E+00	0.9600	7.36E+03	4.21E-01	5.82E+03	3.764899	5.82E+03	0.96
3.89E+00	0.9800	7.67E+03	4.38E-01	6.01E+03	3.779114	6.01E+03	0.98
3.90E+00	1.0000	8.00E+03	4.57E-01	6.21E+03	3.793202	6.21E+03	1.00

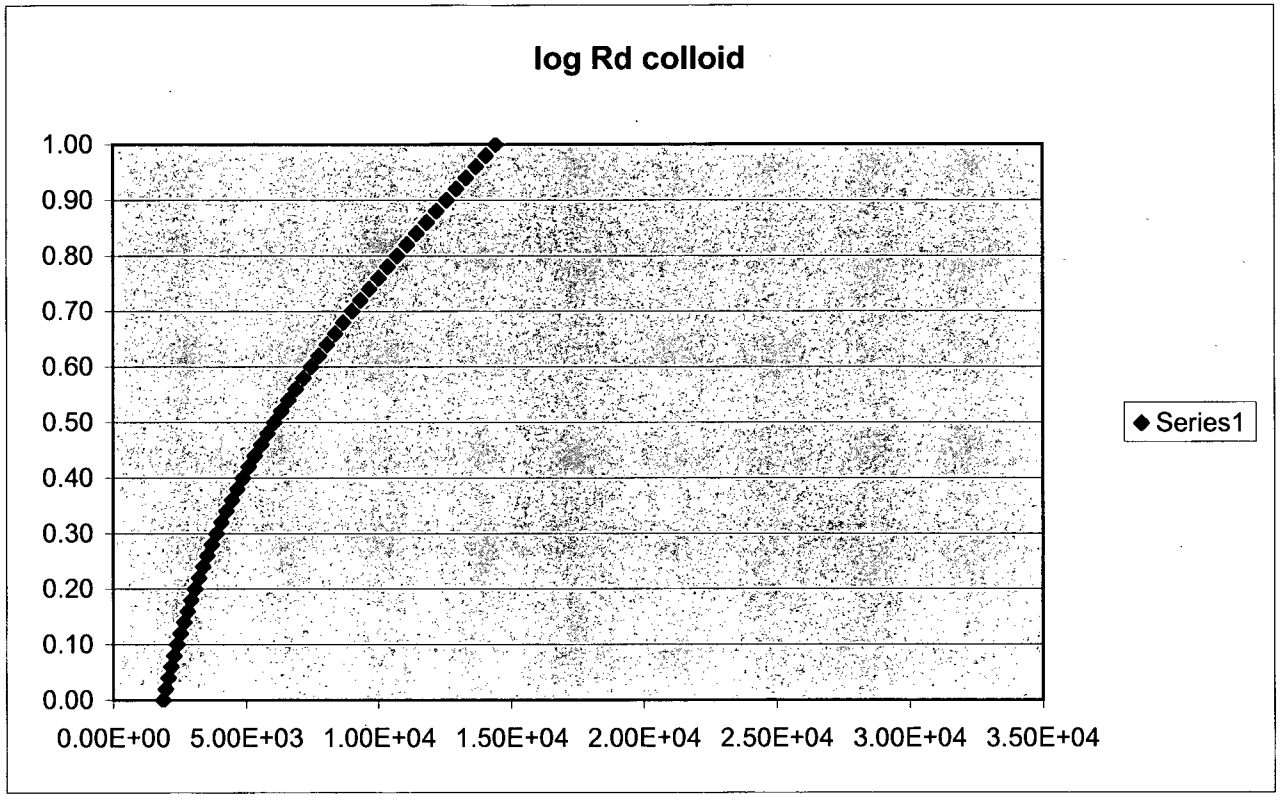
min	max	log Rd	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
0.00E+00	2.70E+00	0.00E+00	0.0000	1.00E+00	0.00E+00	1.00E+00	0	1.00E+00	0.00
log-uniform		5.40E-02	0.0200	1.13E+00	7.56E-06	1.13E+00	0.053979	1.13E+00	0.02
		1.08E-01	0.0400	1.28E+00	1.61E-05	1.28E+00	0.107958	1.28E+00	0.04
		1.62E-01	0.0600	1.45E+00	2.58E-05	1.45E+00	0.161936	1.45E+00	0.06
		2.16E-01	0.0800	1.64E+00	3.68E-05	1.64E+00	0.215914	1.64E+00	0.08
		2.70E-01	0.1000	1.86E+00	4.92E-05	1.86E+00	0.269891	1.86E+00	0.10
		3.24E-01	0.1200	2.11E+00	6.33E-05	2.11E+00	0.323867	2.11E+00	0.12
		3.78E-01	0.1400	2.39E+00	7.93E-05	2.39E+00	0.377843	2.39E+00	0.14
		4.32E-01	0.1600	2.70E+00	9.73E-05	2.70E+00	0.431818	2.70E+00	0.16
		4.86E-01	0.1800	3.06E+00	1.18E-04	3.06E+00	0.485793	3.06E+00	0.18
		5.40E-01	0.2000	3.47E+00	1.41E-04	3.47E+00	0.539767	3.47E+00	0.20
		5.94E-01	0.2200	3.92E+00	1.67E-04	3.92E+00	0.593739	3.92E+00	0.22
		6.48E-01	0.2400	4.44E+00	1.97E-04	4.44E+00	0.647711	4.44E+00	0.24
		7.02E-01	0.2600	5.03E+00	2.30E-04	5.03E+00	0.701682	5.03E+00	0.26
		7.56E-01	0.2800	5.70E+00	2.68E-04	5.70E+00	0.755651	5.70E+00	0.28
		8.10E-01	0.3000	6.45E+00	3.12E-04	6.45E+00	0.809619	6.45E+00	0.30
		8.64E-01	0.3200	7.31E+00	3.60E-04	7.30E+00	0.863585	7.30E+00	0.32
		9.18E-01	0.3400	8.27E+00	4.16E-04	8.27E+00	0.91755	8.27E+00	0.34
		9.72E-01	0.3600	9.37E+00	4.78E-04	9.37E+00	0.971512	9.37E+00	0.36
		1.03E+00	0.3800	1.06E+01	5.49E-04	1.06E+01	1.025473	1.06E+01	0.38
		1.08E+00	0.4000	1.20E+01	6.29E-04	1.20E+01	1.07943	1.20E+01	0.40
		1.13E+00	0.4200	1.36E+01	7.20E-04	1.36E+01	1.133385	1.36E+01	0.42
		1.19E+00	0.4400	1.54E+01	8.23E-04	1.54E+01	1.187336	1.54E+01	0.44
		1.24E+00	0.4600	1.74E+01	9.39E-04	1.74E+01	1.241284	1.74E+01	0.46
		1.30E+00	0.4800	1.97E+01	1.07E-03	1.97E+01	1.295227	1.97E+01	0.48
		1.35E+00	0.5000	2.24E+01	1.22E-03	2.23E+01	1.349166	2.23E+01	0.50
		1.40E+00	0.5200	2.53E+01	1.39E-03	2.53E+01	1.403099	2.53E+01	0.52
		1.46E+00	0.5400	2.87E+01	1.58E-03	2.86E+01	1.457026	2.86E+01	0.54
		1.51E+00	0.5600	3.25E+01	1.80E-03	3.24E+01	1.510947	3.24E+01	0.56
		1.57E+00	0.5800	3.68E+01	2.04E-03	3.67E+01	1.564859	3.67E+01	0.58
		1.62E+00	0.6000	4.16E+01	2.32E-03	4.16E+01	1.618763	4.16E+01	0.60
		1.67E+00	0.6200	4.71E+01	2.64E-03	4.71E+01	1.672656	4.71E+01	0.62
		1.73E+00	0.6400	5.34E+01	2.99E-03	5.33E+01	1.726538	5.33E+01	0.64
		1.78E+00	0.6600	6.04E+01	3.40E-03	6.03E+01	1.780407	6.03E+01	0.66
		1.84E+00	0.6800	6.84E+01	3.85E-03	6.83E+01	1.834262	6.83E+01	0.68
		1.89E+00	0.7000	7.75E+01	4.37E-03	7.73E+01	1.8881	7.73E+01	0.70

1.94E+00	0.7200	8.78E+01	4.96E-03	8.75E+01	1.94192	8.75E+01	0.72
2.00E+00	0.7400	9.94E+01	5.62E-03	9.90E+01	1.995718	9.90E+01	0.74
2.05E+00	0.7600	1.13E+02	6.37E-03	1.12E+02	2.049493	1.12E+02	0.76
2.11E+00	0.7800	1.27E+02	7.22E-03	1.27E+02	2.10324	1.27E+02	0.78
2.16E+00	0.8000	1.44E+02	8.19E-03	1.44E+02	2.156957	1.44E+02	0.80
2.21E+00	0.8200	1.63E+02	9.28E-03	1.62E+02	2.21064	1.62E+02	0.82
2.27E+00	0.8400	1.85E+02	1.05E-02	1.84E+02	2.264283	1.84E+02	0.84
2.32E+00	0.8600	2.09E+02	1.19E-02	2.08E+02	2.317883	2.08E+02	0.86
2.38E+00	0.8800	2.37E+02	1.35E-02	2.35E+02	2.371432	2.35E+02	0.88
2.43E+00	0.9000	2.69E+02	1.53E-02	2.66E+02	2.424925	2.66E+02	0.90
2.48E+00	0.9200	3.04E+02	1.73E-02	3.01E+02	2.478354	3.01E+02	0.92
2.54E+00	0.9400	3.44E+02	1.96E-02	3.40E+02	2.531712	3.40E+02	0.94
2.59E+00	0.9600	3.90E+02	2.22E-02	3.85E+02	2.584988	3.85E+02	0.96
2.64E+00	0.9800	4.42E+02	2.52E-02	4.35E+02	2.638172	4.35E+02	0.98
2.70E+00	1.0000	5.00E+02	2.85E-02	4.91E+02	2.691253	4.91E+02	1.00

min	max	log Rd	cumul prob	10exp(x)	calc Kd	Rd,eff	log Rd,eff	Rd,eff	cumul prob
3.30E+00	4.48E+00	3.30E+00	0.0000	2.00E+03	1.14E-01	1.87E+03	3.270865	1.87E+03	0.00
log-uniform		3.32E+00	0.0200	2.11E+03	1.21E-01	1.96E+03	3.292767	1.96E+03	0.02
		3.35E+00	0.0400	2.23E+03	1.27E-01	2.06E+03	3.314585	2.06E+03	0.04
		3.37E+00	0.0600	2.35E+03	1.34E-01	2.17E+03	3.336315	2.17E+03	0.06
		3.40E+00	0.0800	2.48E+03	1.42E-01	2.28E+03	3.357953	2.28E+03	0.08
		3.42E+00	0.1000	2.62E+03	1.50E-01	2.40E+03	3.379496	2.40E+03	0.10
		3.44E+00	0.1200	2.77E+03	1.58E-01	2.52E+03	3.400938	2.52E+03	0.12
		3.47E+00	0.1400	2.92E+03	1.67E-01	2.64E+03	3.422275	2.64E+03	0.14
		3.49E+00	0.1600	3.08E+03	1.76E-01	2.78E+03	3.443502	2.78E+03	0.16
		3.51E+00	0.1800	3.26E+03	1.86E-01	2.91E+03	3.464614	2.91E+03	0.18
		3.54E+00	0.2000	3.44E+03	1.96E-01	3.06E+03	3.485607	3.06E+03	0.20
		3.56E+00	0.2200	3.63E+03	2.07E-01	3.21E+03	3.506476	3.21E+03	0.22
		3.58E+00	0.2400	3.83E+03	2.19E-01	3.37E+03	3.527214	3.37E+03	0.24
		3.61E+00	0.2600	4.04E+03	2.31E-01	3.53E+03	3.547816	3.53E+03	0.26
		3.63E+00	0.2800	4.27E+03	2.44E-01	3.70E+03	3.568277	3.70E+03	0.28
		3.65E+00	0.3000	4.51E+03	2.57E-01	3.88E+03	3.58859	3.88E+03	0.30
		3.68E+00	0.3200	4.76E+03	2.72E-01	4.06E+03	3.608751	4.06E+03	0.32
		3.70E+00	0.3400	5.02E+03	2.87E-01	4.25E+03	3.628753	4.25E+03	0.34
		3.72E+00	0.3600	5.30E+03	3.03E-01	4.45E+03	3.648589	4.45E+03	0.36
		3.75E+00	0.3800	5.60E+03	3.20E-01	4.66E+03	3.668254	4.66E+03	0.38
		3.77E+00	0.4000	5.91E+03	3.38E-01	4.87E+03	3.687741	4.87E+03	0.40
		3.79E+00	0.4200	6.24E+03	3.56E-01	5.09E+03	3.707044	5.09E+03	0.42
		3.82E+00	0.4400	6.58E+03	3.76E-01	5.32E+03	3.726156	5.32E+03	0.44
		3.84E+00	0.4600	6.95E+03	3.97E-01	5.56E+03	3.745071	5.56E+03	0.46
		3.87E+00	0.4800	7.34E+03	4.19E-01	5.80E+03	3.763782	5.80E+03	0.48
		3.89E+00	0.5000	7.75E+03	4.43E-01	6.06E+03	3.782282	6.06E+03	0.50
		3.91E+00	0.5200	8.18E+03	4.67E-01	6.32E+03	3.800565	6.32E+03	0.52
		3.94E+00	0.5400	8.63E+03	4.93E-01	6.59E+03	3.818624	6.59E+03	0.54
		3.96E+00	0.5600	9.11E+03	5.21E-01	6.86E+03	3.836453	6.86E+03	0.56
		3.98E+00	0.5800	9.62E+03	5.50E-01	7.15E+03	3.854045	7.15E+03	0.58
		4.01E+00	0.6000	1.02E+04	5.80E-01	7.44E+03	3.871393	7.44E+03	0.60
		4.03E+00	0.6200	1.07E+04	6.13E-01	7.74E+03	3.888492	7.74E+03	0.62
		4.05E+00	0.6400	1.13E+04	6.47E-01	8.04E+03	3.905335	8.04E+03	0.64
		4.08E+00	0.6600	1.19E+04	6.83E-01	8.35E+03	3.921915	8.35E+03	0.66
		4.10E+00	0.6800	1.26E+04	7.21E-01	8.67E+03	3.938228	8.67E+03	0.68
		4.12E+00	0.7000	1.33E+04	7.61E-01	9.00E+03	3.954267	9.00E+03	0.70

4.15E+00	0.7200	1.41E+04	8.03E-01	9.33E+03	3.970028	9.33E+03	0.72
4.17E+00	0.7400	1.48E+04	8.48E-01	9.67E+03	3.985504	9.67E+03	0.74
4.19E+00	0.7600	1.57E+04	8.95E-01	1.00E+04	4.000691	1.00E+04	0.76
4.22E+00	0.7800	1.65E+04	9.45E-01	1.04E+04	4.015584	1.04E+04	0.78
4.24E+00	0.8000	1.75E+04	9.97E-01	1.07E+04	4.030179	1.07E+04	0.80
4.27E+00	0.8200	1.84E+04	1.05E+00	1.11E+04	4.044472	1.11E+04	0.82
4.29E+00	0.8400	1.95E+04	1.11E+00	1.14E+04	4.05846	1.14E+04	0.84
4.31E+00	0.8600	2.05E+04	1.17E+00	1.18E+04	4.07214	1.18E+04	0.86
4.34E+00	0.8800	2.17E+04	1.24E+00	1.22E+04	4.085508	1.22E+04	0.88
4.36E+00	0.9000	2.29E+04	1.31E+00	1.25E+04	4.098562	1.25E+04	0.90
4.38E+00	0.9200	2.42E+04	1.38E+00	1.29E+04	4.111301	1.29E+04	0.92
4.41E+00	0.9400	2.55E+04	1.46E+00	1.33E+04	4.123723	1.33E+04	0.94
4.43E+00	0.9600	2.69E+04	1.54E+00	1.37E+04	4.135828	1.37E+04	0.96
4.45E+00	0.9800	2.84E+04	1.62E+00	1.40E+04	4.147614	1.40E+04	0.98
4.48E+00	1.0000	3.00E+04	1.71E+00	1.44E+04	4.159081	1.44E+04	1.00


log Rd start
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
2.50E+04
3.00E+04
3.50E+04
Series1


log Rd colloid
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00E+00
5.00E+03
1.00E+04
1.50E+04
2.00E+04
2.50E+04
3.00E+04
3.50E+04
Series1

These Rd's are all constants in the input file

	Rd	calc Kd (m3/kg)	Rd,eff'
ImmobileRD_STFF_Am	1.80E+04	1.70E+00	3.60E+04
ImmobileRD_STFF_Np	19	1.70E-03	1.90E+01
ImmobileRD_STFF_I	1	0.00E+00	1.00E+00
ImmobileRD_STFF_Tc	1	0.00E+00	1.00E+00
ImmobileRD_STFF_Cl	1	0.00E+00	1.00E+00
ImmobileRD_STFF_Cm	1.80E+04	1.70E+00	3.60E+04
ImmobileRD_STFF_U	37	3.40E-03	3.71E+01
ImmobileRD_STFF_Pu	1.80E+03	1.70E-01	1.98E+03
ImmobileRD_STFF_Th	1.80E+04	1.70E+00	3.60E+04
ImmobileRD_STFF_Ra	5.40E+03	5.09E-01	7.02E+03
ImmobileRD_STFF_Pb	5.40E+03	5.09E-01	7.02E+03
ImmobileRD_STFF_Cs	9.00E+03	8.49E-01	1.35E+04
ImmobileRD_STFF_Ni	1.80E+03	1.70E-01	1.98E+03
ImmobileRD_STFF_C	1	0.00E+00	1.00E+00
ImmobileRD_STFF_Se	55	5.09E-03	5.52E+01
ImmobileRD_STFF_Nb	1.80E+04	1.70E+00	3.60E+04

The altered Rd assumes that DiffusionRate_STFF is fixed at 0.001 m2/y.