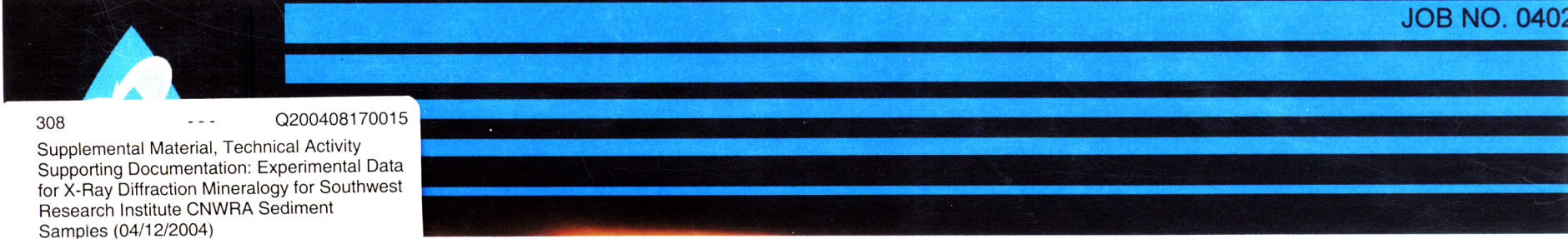


***X-RAY DIFFRACTION MINERALOGY
FOR
SOUTHWEST RESEARCH INSTITUTE
CNWRA SEDIMENT SAMPLES***

Core Lab
PETROLEUM SERVICES

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JOB NO. 0402



308

Q200408170015

Supplemental Material, Technical Activity
Supporting Documentation: Experimental Data
for X-Ray Diffraction Mineralogy for Southwest
Research Institute CNWRA Sediment
Samples (04/12/2004)

Sample and Analysis Information			Total Sample Mineralogy (Weight %)								Relative Phyllosilicate Abundance (Normalized to 100%)			
Specimen I.D. No.	Bulk Pattern (*.MDI)	Clay Pattern (*.RAW)	Quartz	Cristobalite	K-Feldspar	Plagioclase	Calcite	Dolomite	Clinoptilolite	Total Phyllosilicates	Smectite	Illite & Mica	Kaolinite	Chlorite
628-01	4021601	040216Gg01	16	9	35	20	0	0	4	16	86	10	4	0
628-02	4021602	040216Gg02	16	11	39	15	Tr	0	3	16	86	9	5	0
628-03	4021603	040216Gg03	16	13	38	16	0	0	4	13	82	12	6	0
628-04	4021604	040216Gg04	18	11	34	19	0	0	5	13	84	8	8	0
628-05	4021605	040216Gg05	11	20	34	14	1	0	3	17	85	10	5	0
628-06	4021606	040216Gg06	15	14	35	17	0	0	3	16	84	10	6	0
628-07	4021607	040216Gg07	23	10	28	13	0	0	6	20	81	11	8	0
628-08	4021608	040216Gg08	18	11	30	13	7	0	4	17	82	12	6	0
628-09	4021609	040216Gg09	22	10	29	14	0	0	5	20	83	10	7	0
628-10	4021610	040216Gg10	22	12	32	14	0	0	4	16	80	13	7	0
628-11	4021611	040216Gg11	19	5	27	16	0	0	7	26	87	9	4	0
628-12	4021612	040216Gg12	19	10	34	16	0	0	4	17	86	8	6	0
628-13	4021613	040216Gg13	20	12	28	13	0	0	5	22	86	9	5	0
628-14	4021614	040216Gg14	23	13	27	14	0	0	5	18	82	10	8	0
628-15	4021615	040216Gg15	20	12	29	16	0	0	5	18	80	12	8	0
628-16	4021616	040216Gg16	18	11	33	17	0	0	4	17	82	11	7	0
628-17	4021617	040216Gg17	16	7	36	14	0	0	6	21	87	10	3	0
628-18	4021618	040216Gg18	17	12	35	15	0	0	7	14	78	14	8	0
628-19	4021619	040216Gg19	20	7	26	14	0	0	9	24	83	10	7	0
628-20	4021620	040216Gg20	23	7	27	14	0	0	8	21	78	14	8	0
628-21	4021621	040216Gg21	20	8	29	17	0	0	9	17	83	11	6	0
628-22	4021622	040216Gg22	18	8	30	16	Tr	0	7	21	86	9	5	0
628-23	4021623	040216Gg23	17	10	33	16	1	0	5	18	80	14	6	0
628-24	4021624	040216Gg24	17	10	29	15	0	0	11	18	79	12	9	0
628-25	4021625	040216Gg25	20	3	30	20	Tr	0	8	19	83	14	3	0
628-26	4021626	040216Gg26	15	8	36	18	0	0	9	14	81	11	8	0
628-27	4021627	040216Gg27	10	6	16	9	0	0	3	56	90	7	3	0
628-28	4021628	040216Gg28	18	7	31	13	0	0	7	24	83	10	7	0
628-29	4021629	040216Gg29	20	10	24	13	0	0	9	24	82	11	7	0
628-30	4021630	040216Gg30	19	10	22	12	0	0	11	26	83	10	7	0
628-31	4021631	040216Gg31	3	0	44	49	1	0	0	3	64	36	0	0
628-32	4021632	040216Gg32	53	0	1	1	15	0	15	15	96	4	0	0
628-33	4021633	040216Gg33	65	0	1	Tr	5	0	21	8	91	6	3	0

Tr = Trace (<0.5%)

Core Laboratories XRD

Whole-Rock and Clay Fraction Analytical Procedures

Sample Preparation

Samples submitted for whole-rock and clay-fraction XRD mineral analyses are first cleaned of obvious drilling contaminants and then disaggregated in a mortar and pestle. Approximately five grams of each sample are transferred to isopropyl alcohol and pulverized using a McCrone micronizing mill. The resultant powders are dried, disaggregated, and packed into aluminum sample holders to produce random whole-rock mounts. A separate split of each sample is dispersed in a dilute sodium phosphate solution using a sonic probe. The suspensions are then centrifugally size-fractionated to isolate clay-size (<4 micron ESD) materials for a separate clay-fraction mount. The suspensions are then vacuum-deposited on silver membrane filters to produce oriented clay mineral aggregates. Membrane mounts are attached to stainless steel slugs and exposed to ethylene glycol vapor for a minimum of 24 hours.

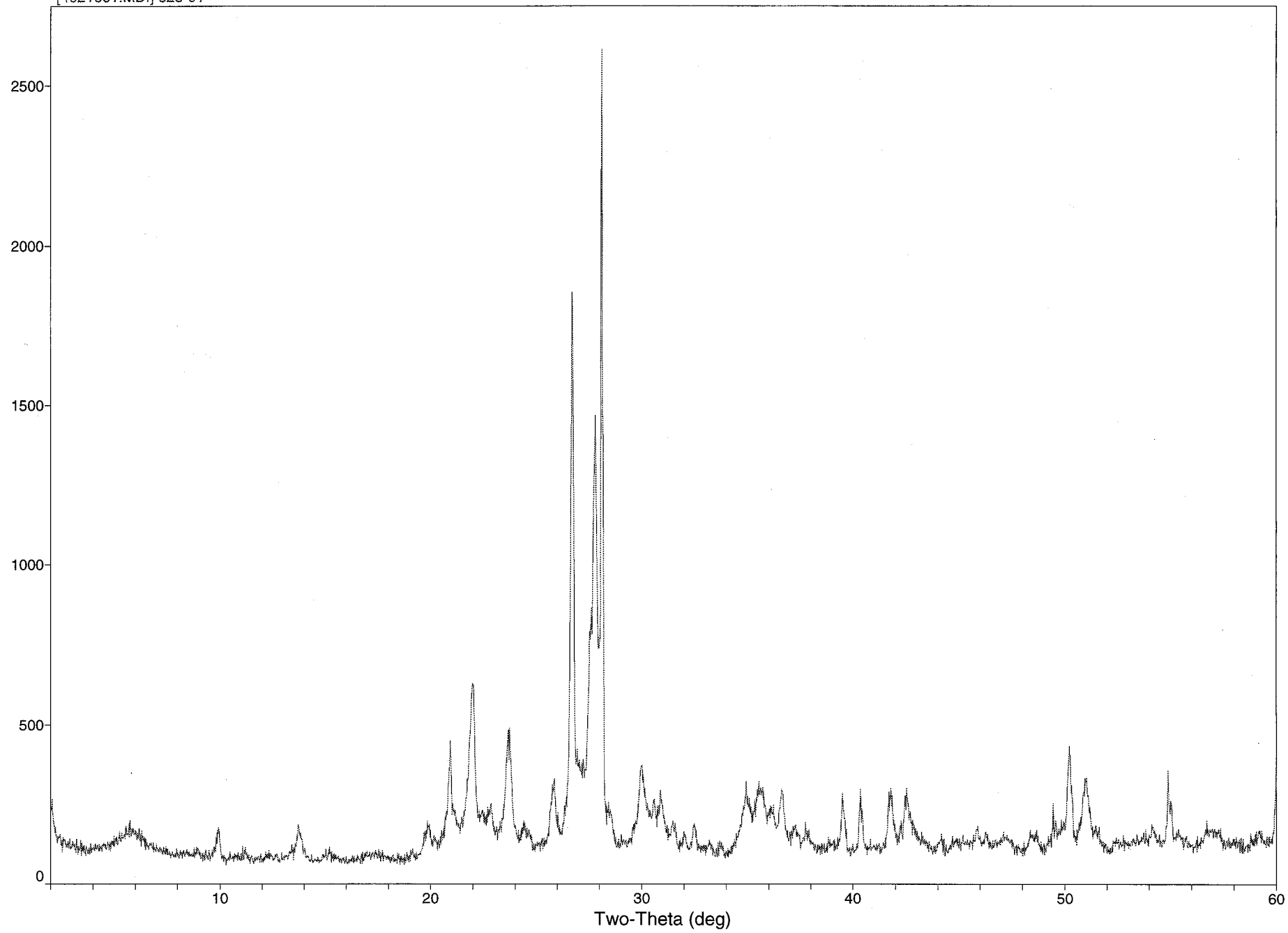
Analytical Procedures

XRD analyses of the samples are performed utilizing a Scintag or Philips automated powder diffractometer equipped with a copper source (40kV, 40mA) and a solid state or scintillation detector. The whole rock samples are analyzed over an angular range of 2-60 degrees 2-theta at a scan rate of one degree/minute. The glycol-solvated clay-fraction mounts are analyzed over an angular range of 2-50 degrees 2-theta at a rate of 1.5 degrees/minute.

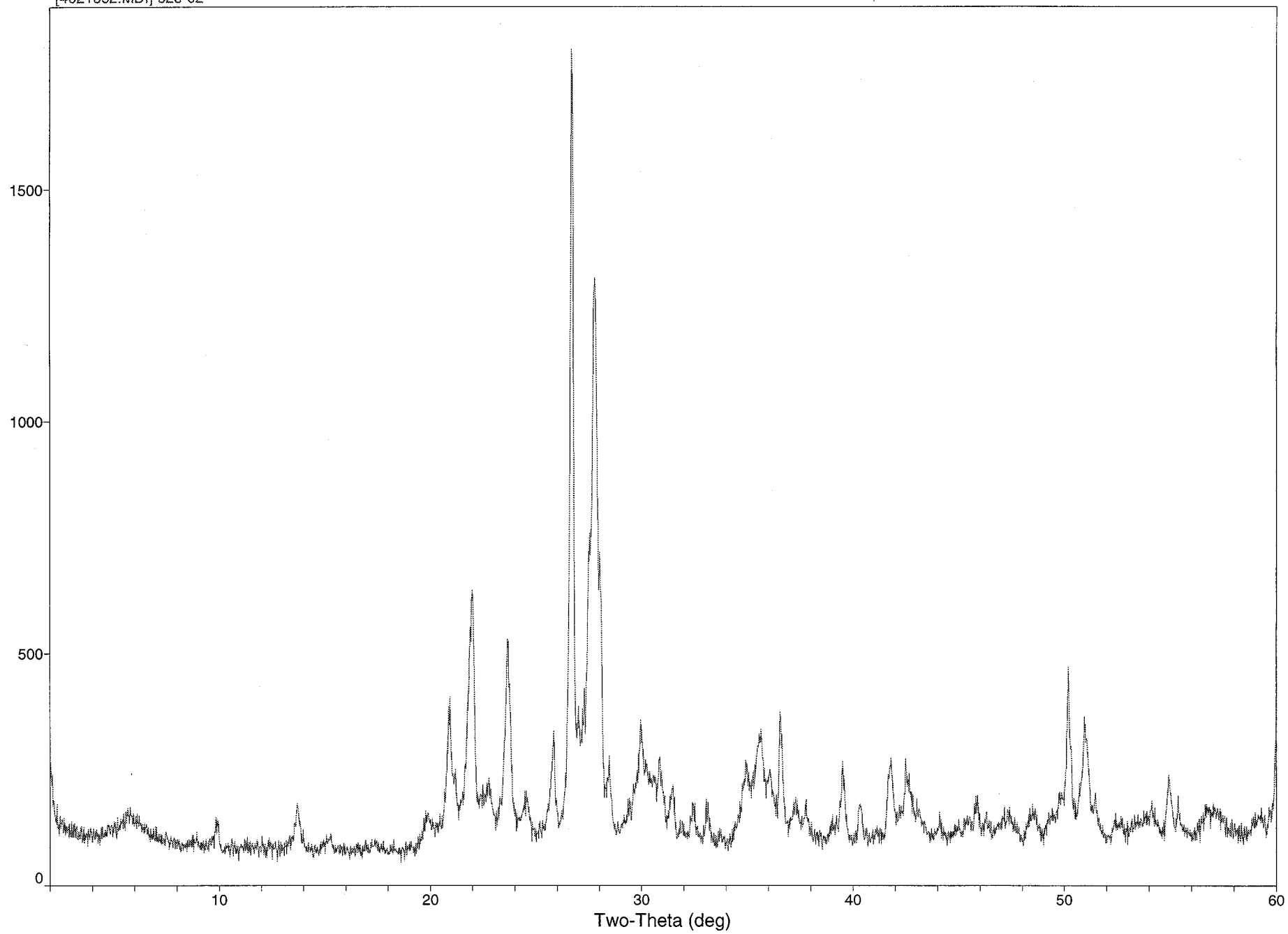
Semi-quantitative determinations of whole-rock and phyllosilicate mineral amounts are done utilizing integrated peak areas (derived from peak-decomposition / profile-fitting methods) and empirical reference intensity ratio (RIR) factors determined specifically for the diffractometer used in data collection. The total clay mineral (including mica) abundance of each sample is determined from the whole-rock XRD patterns using combined {001} and {hkl} clay mineral reflections and suitable empirical RIR factors.

XRD patterns from glycol-solvated clay-fraction samples are analyzed using techniques similar to those described above. Determinations of mixed-layer clay ordering and expandability are done by comparing experimental diffraction data from the glycol-solvated clay mineral aggregates with simulated one dimensional diffraction profiles generated using the program NEWMOD written by R.C. Reynolds.

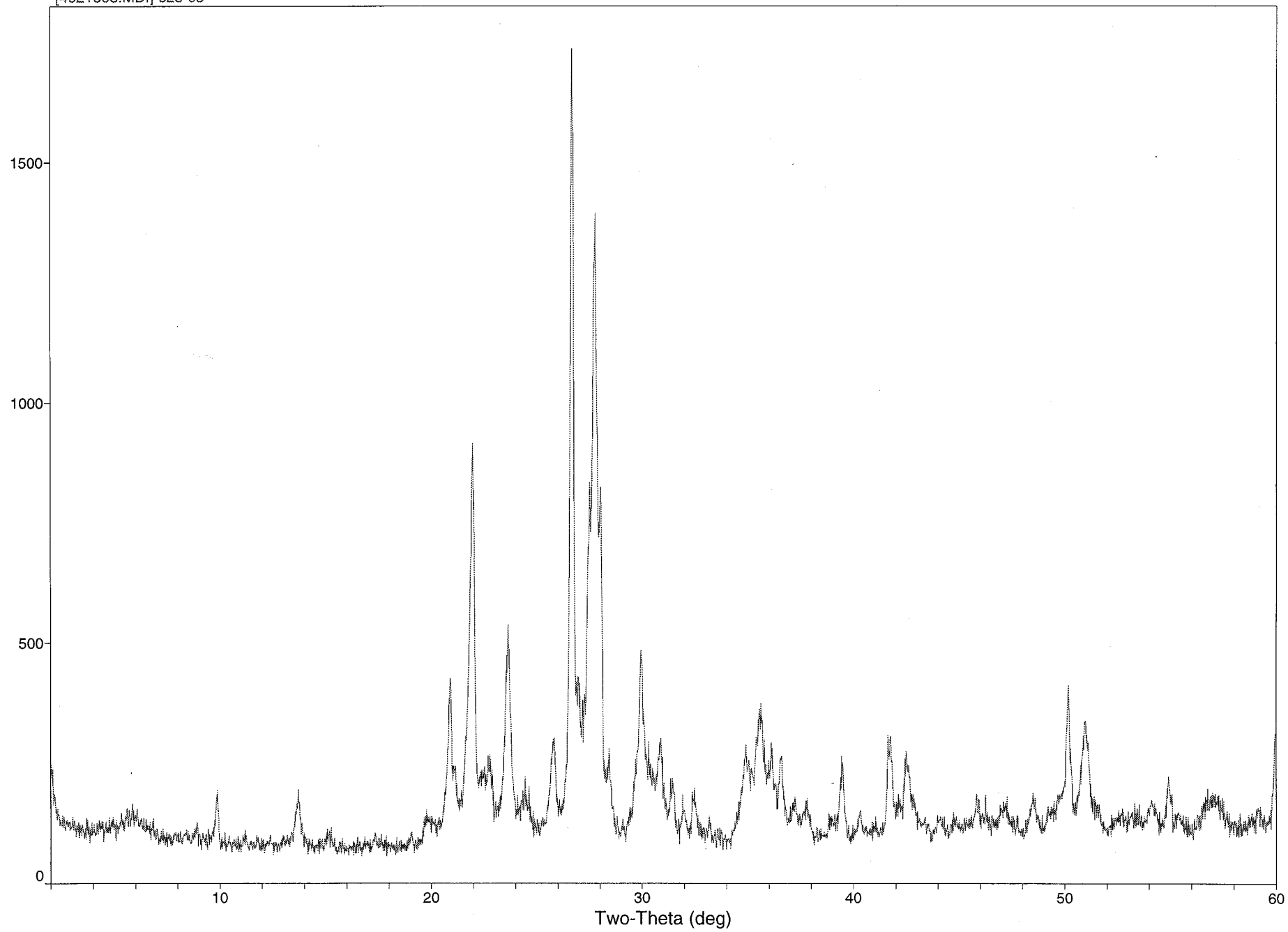
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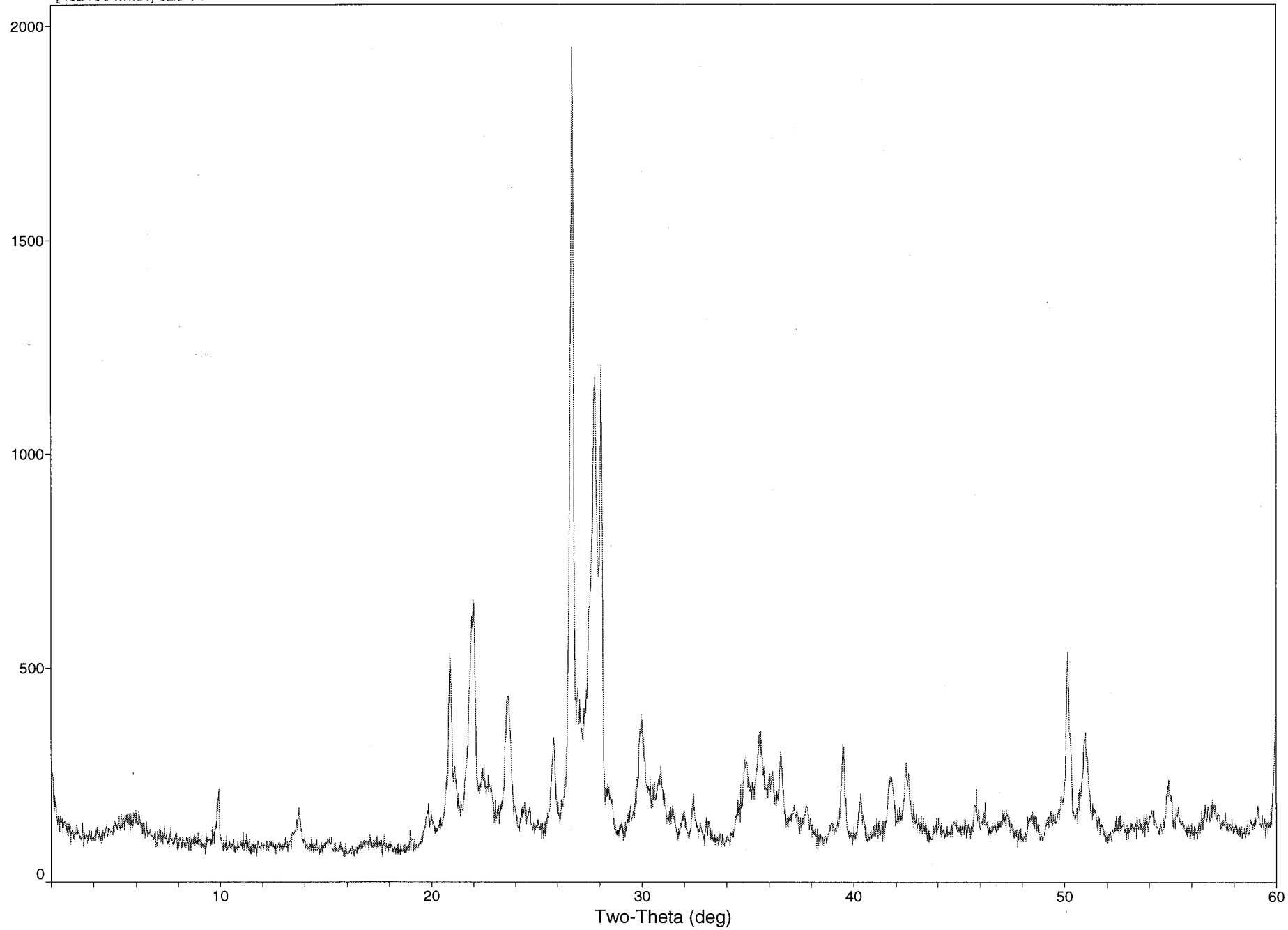
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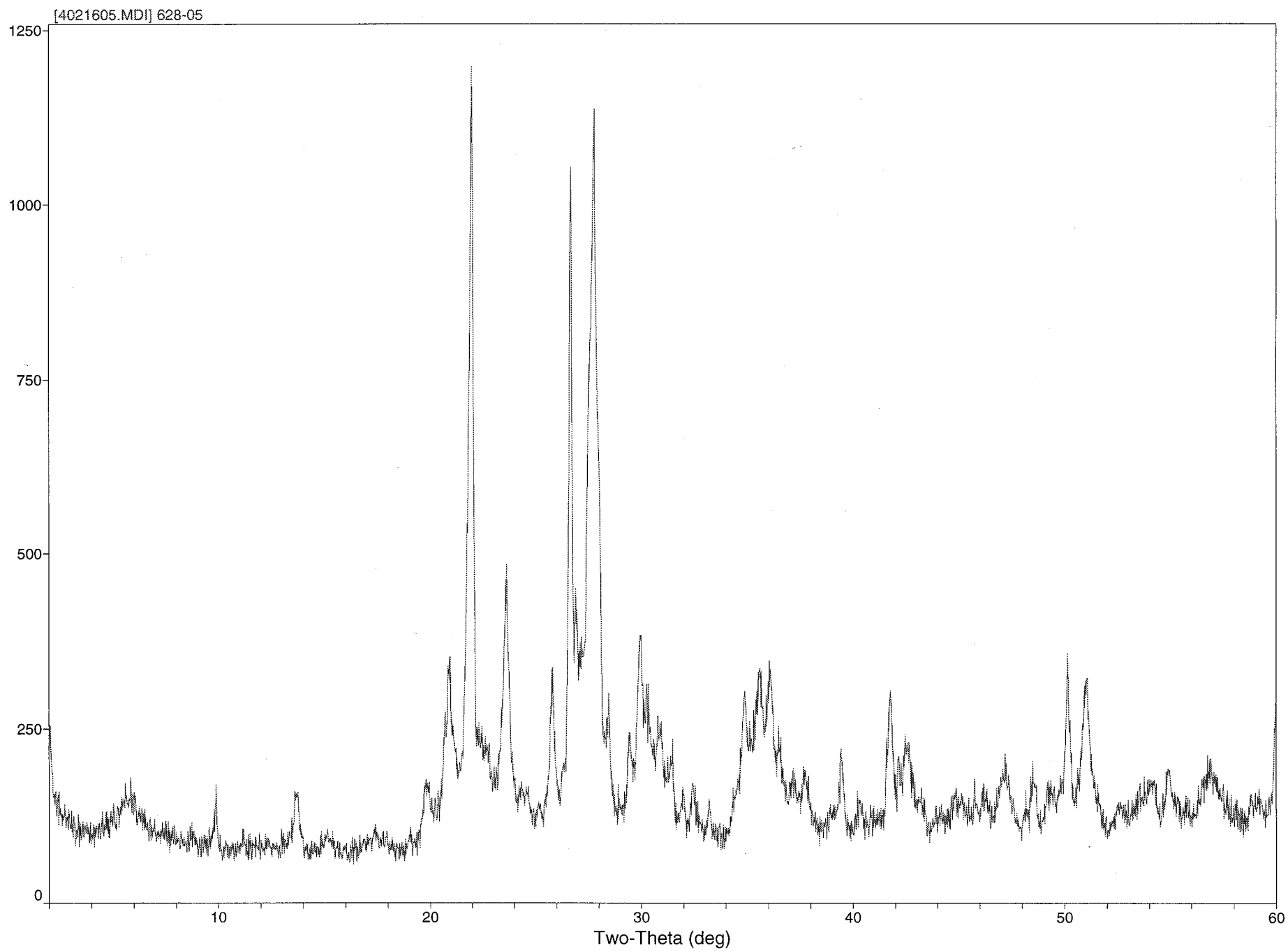


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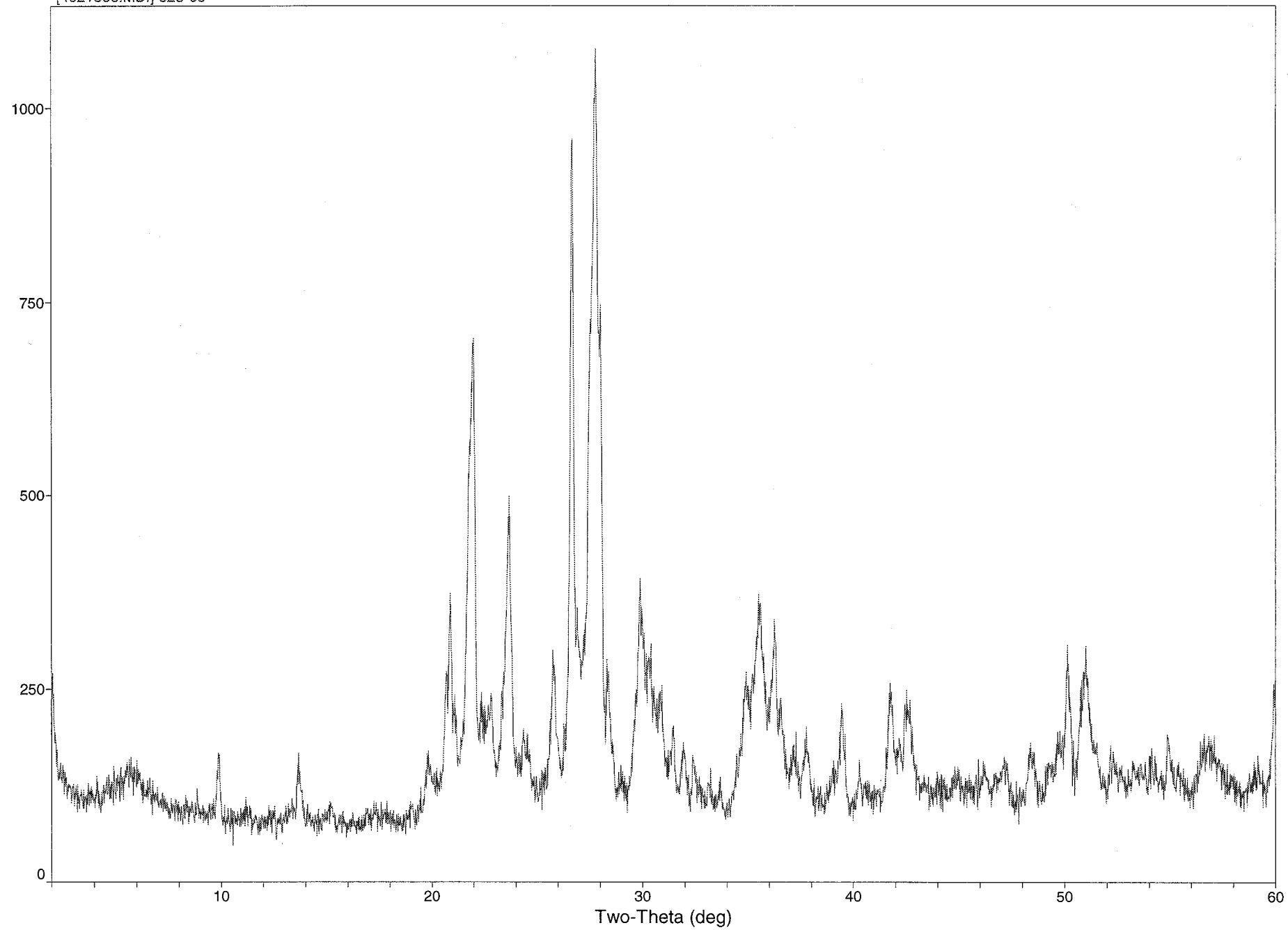


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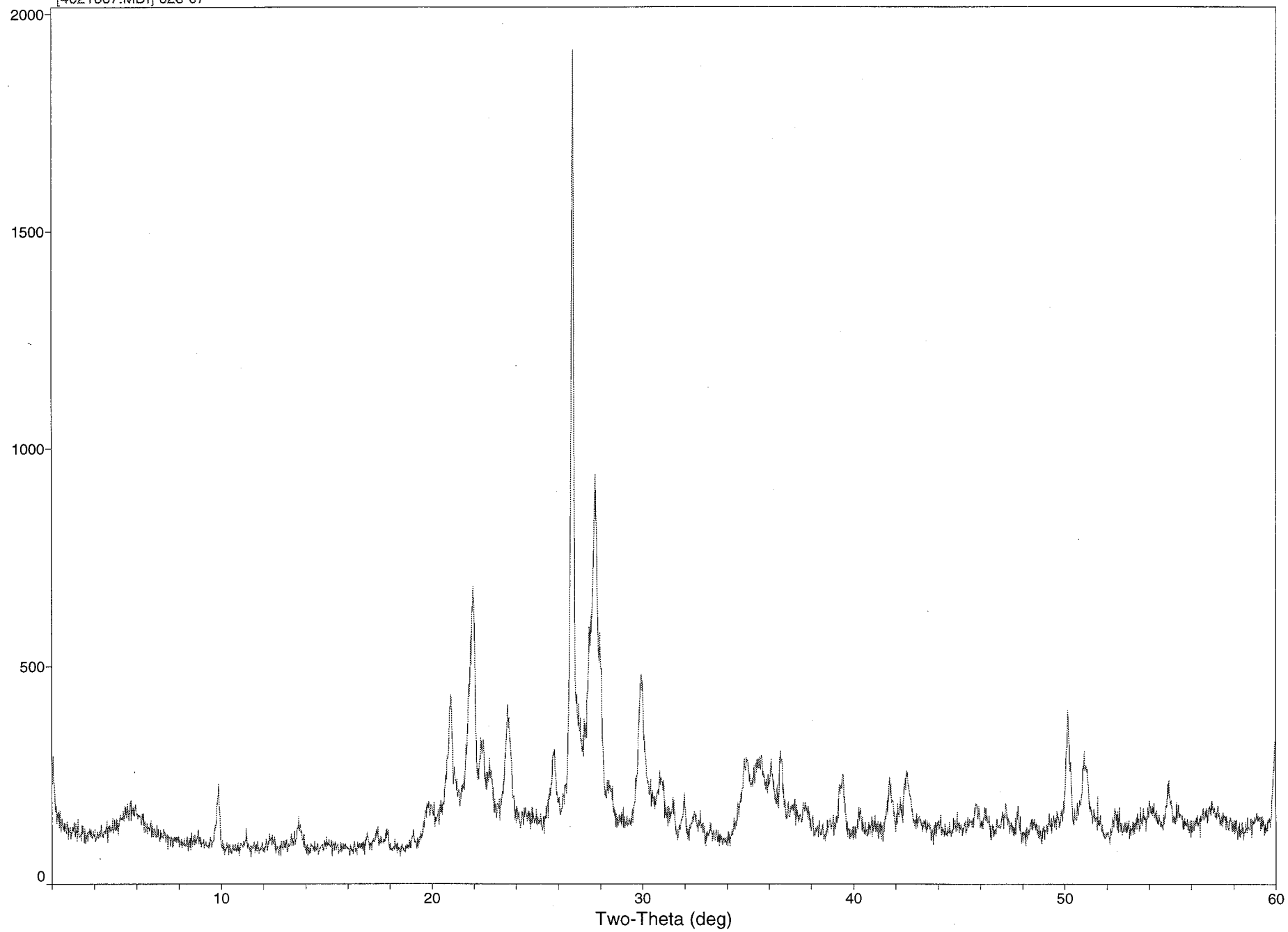




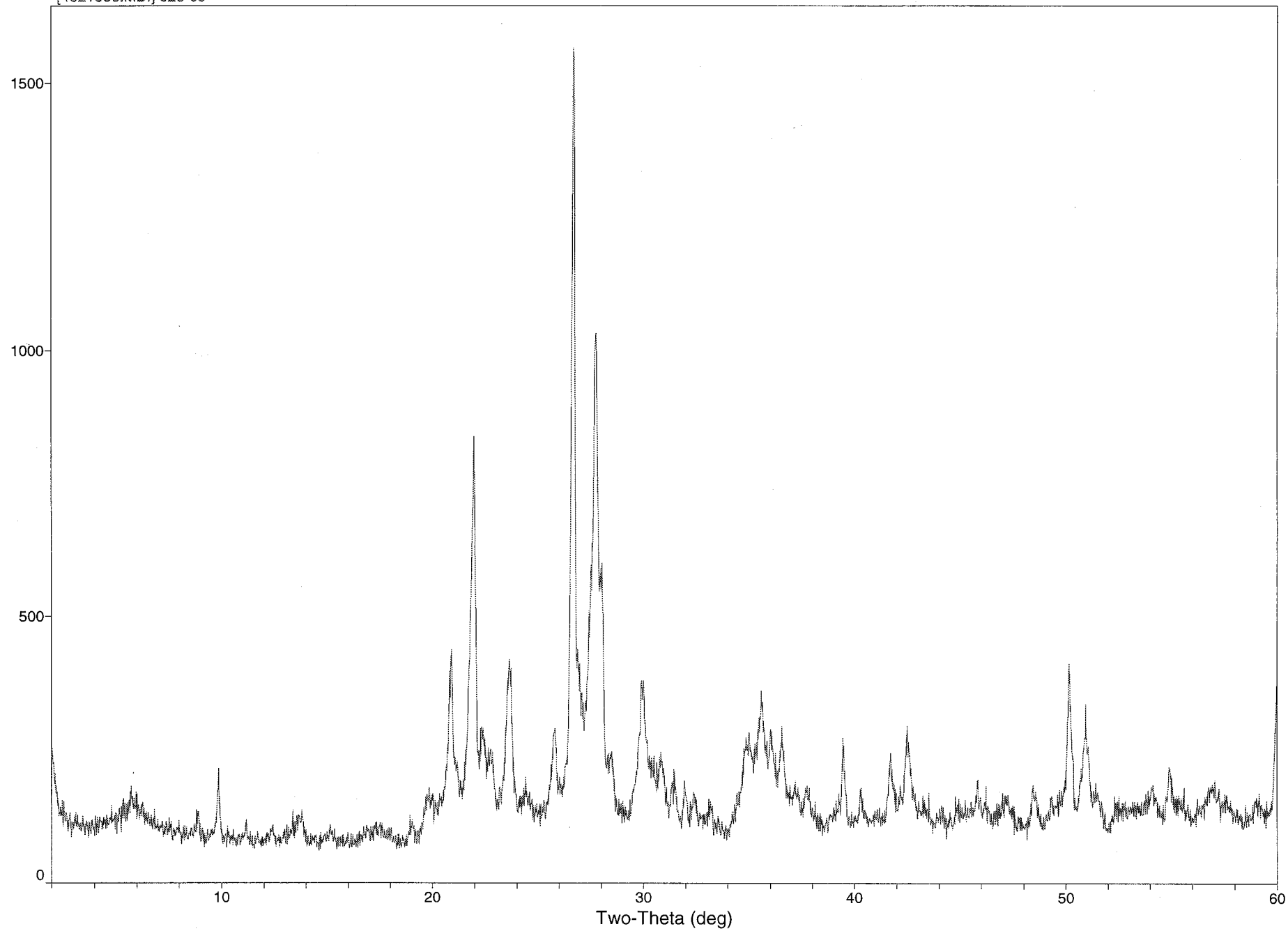
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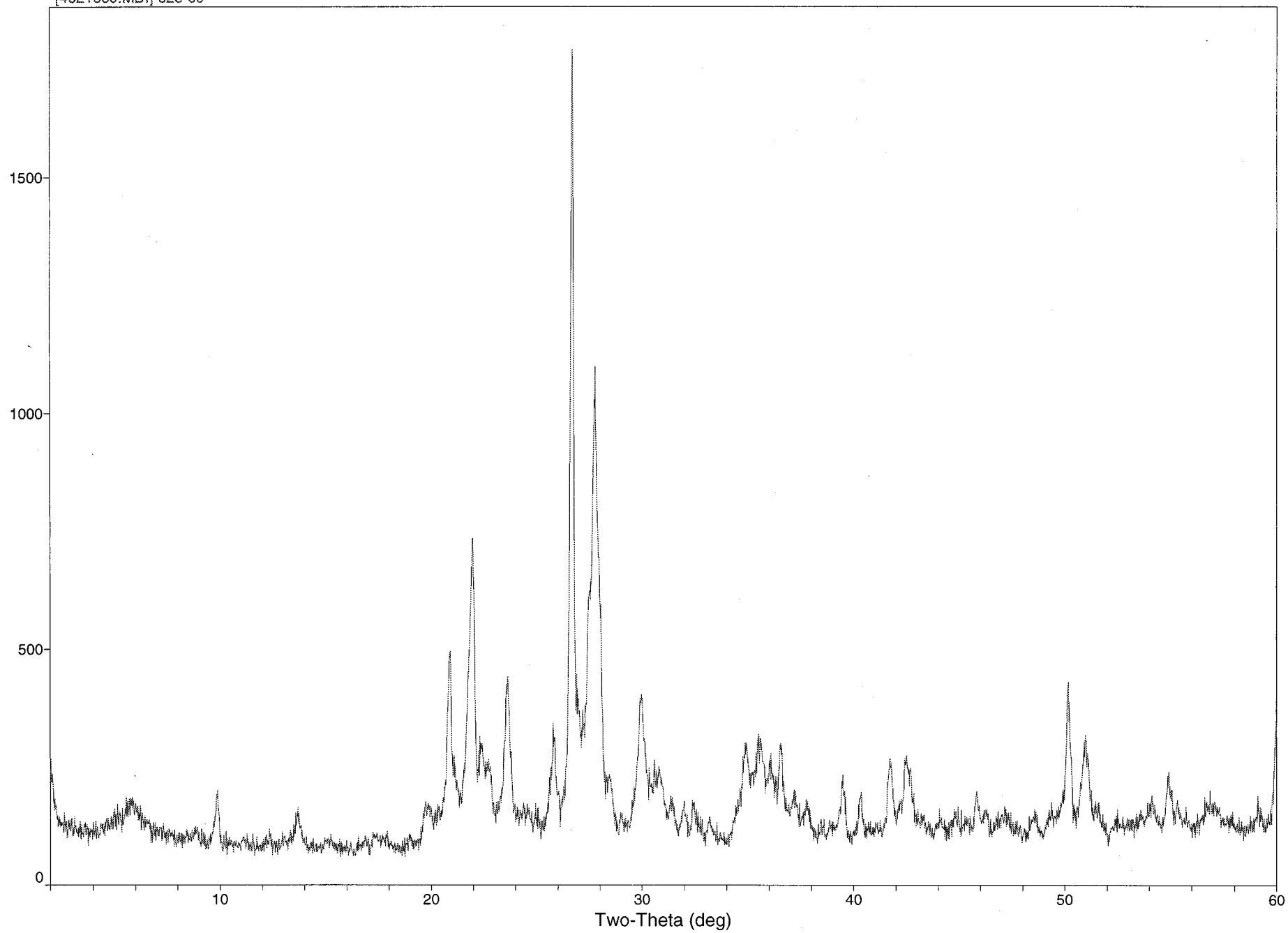
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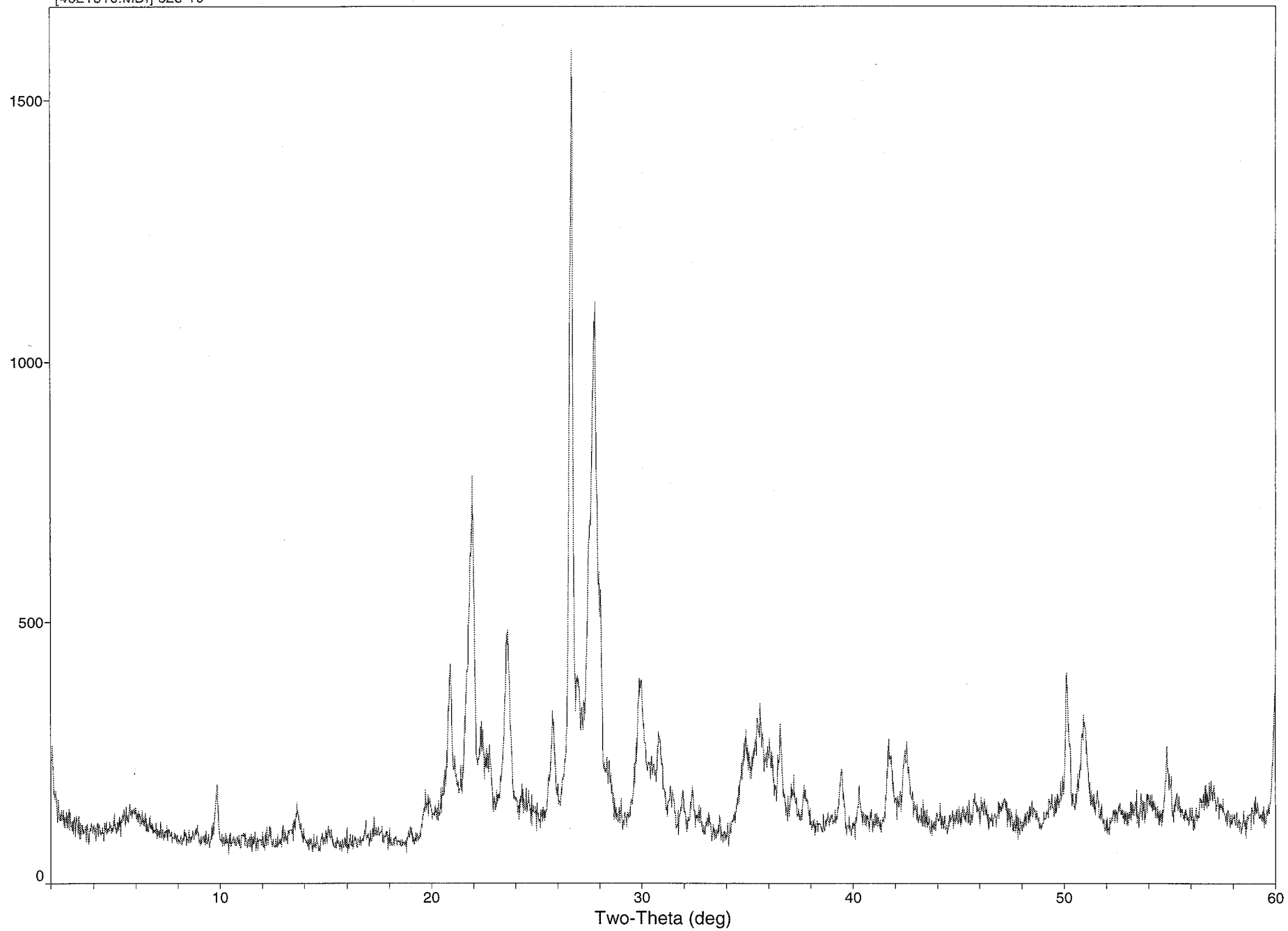
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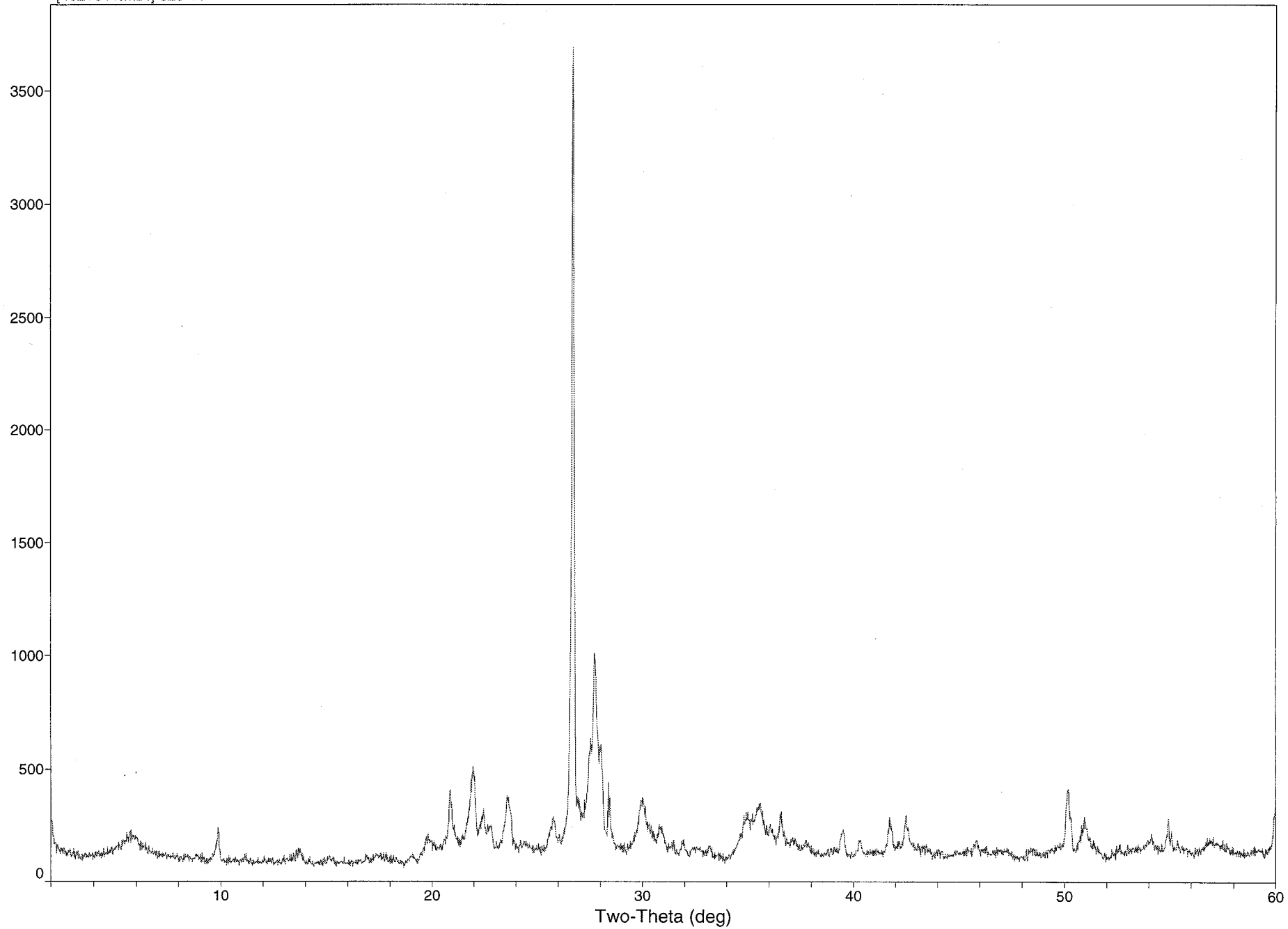
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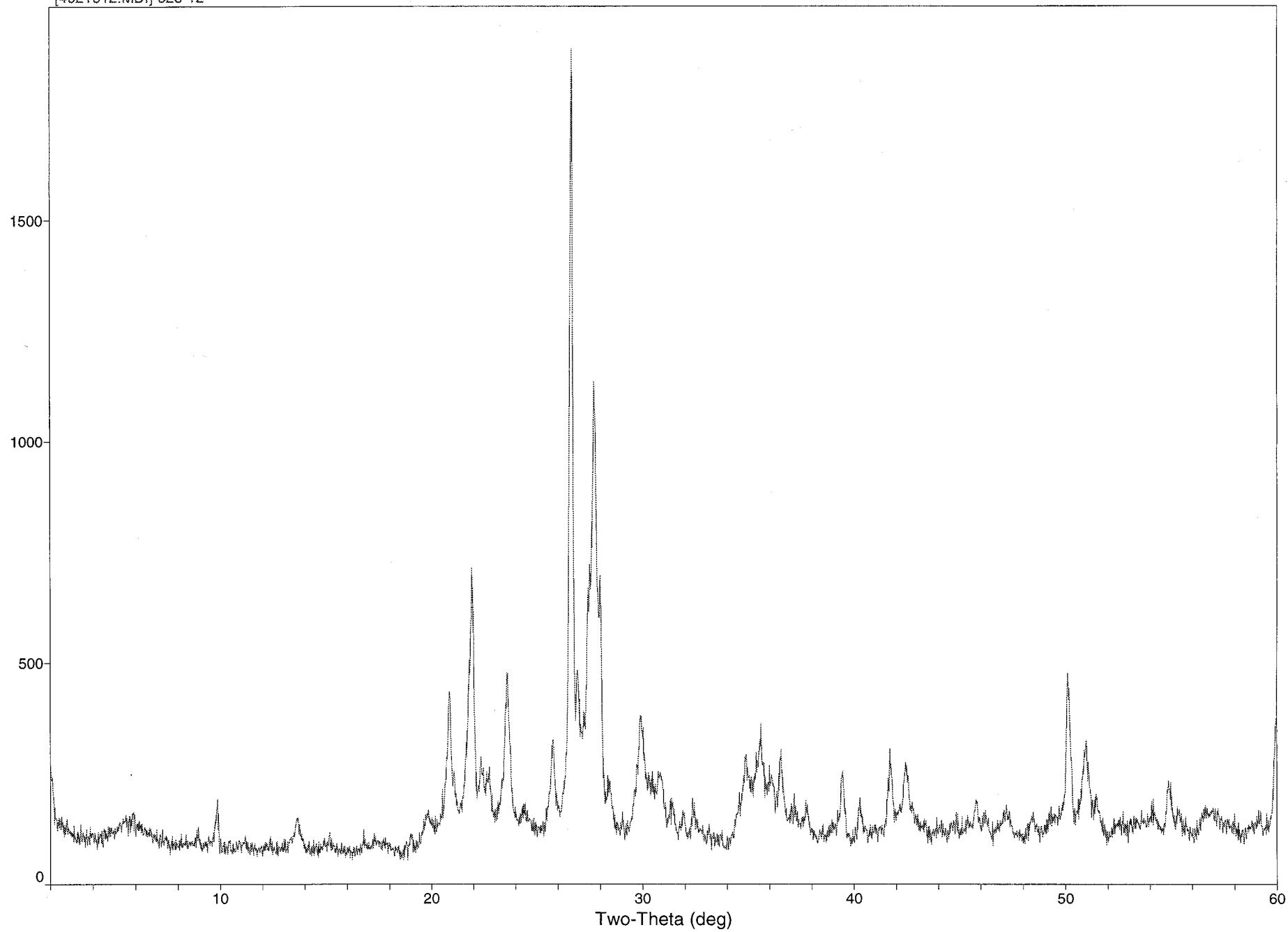
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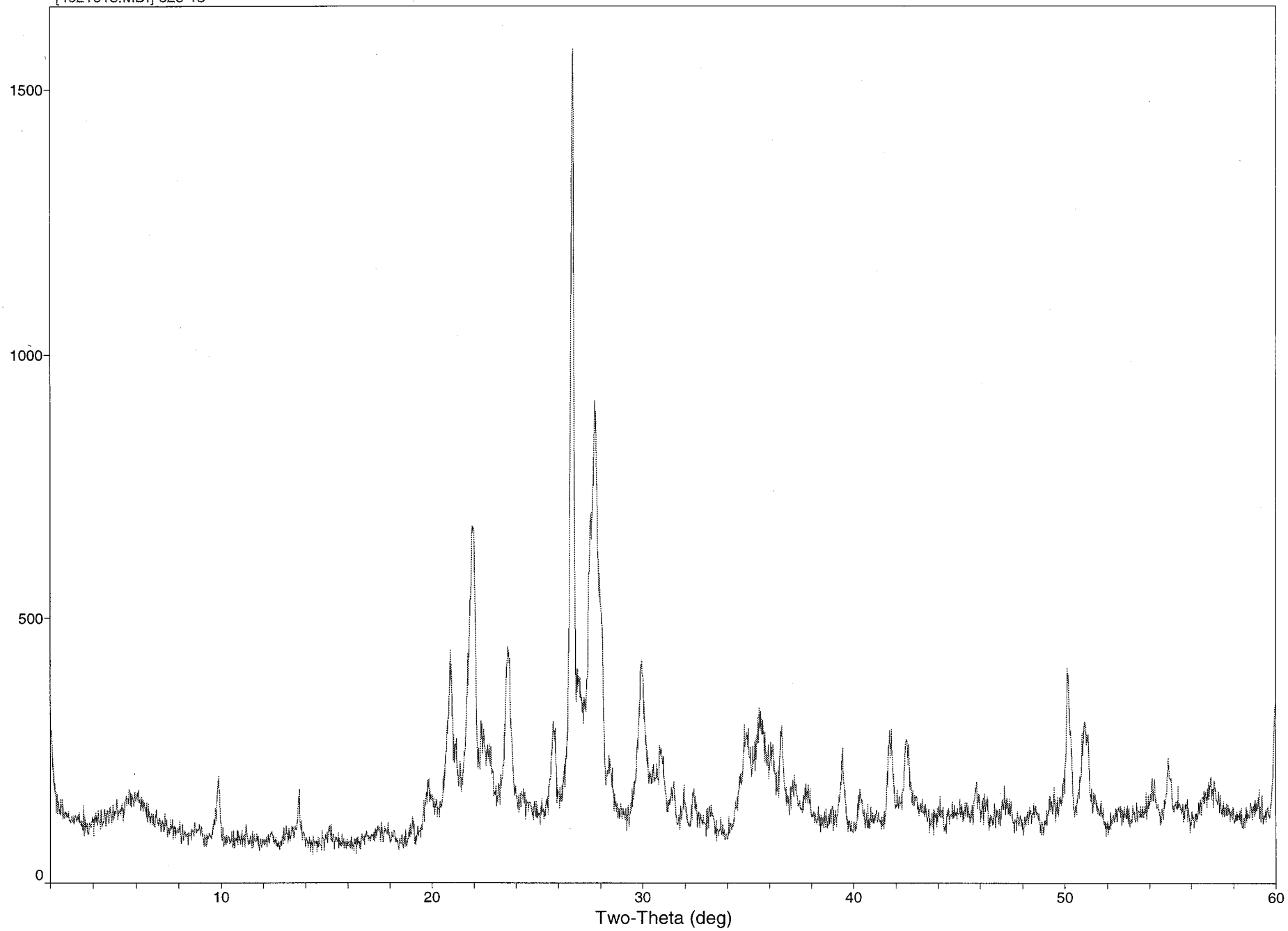
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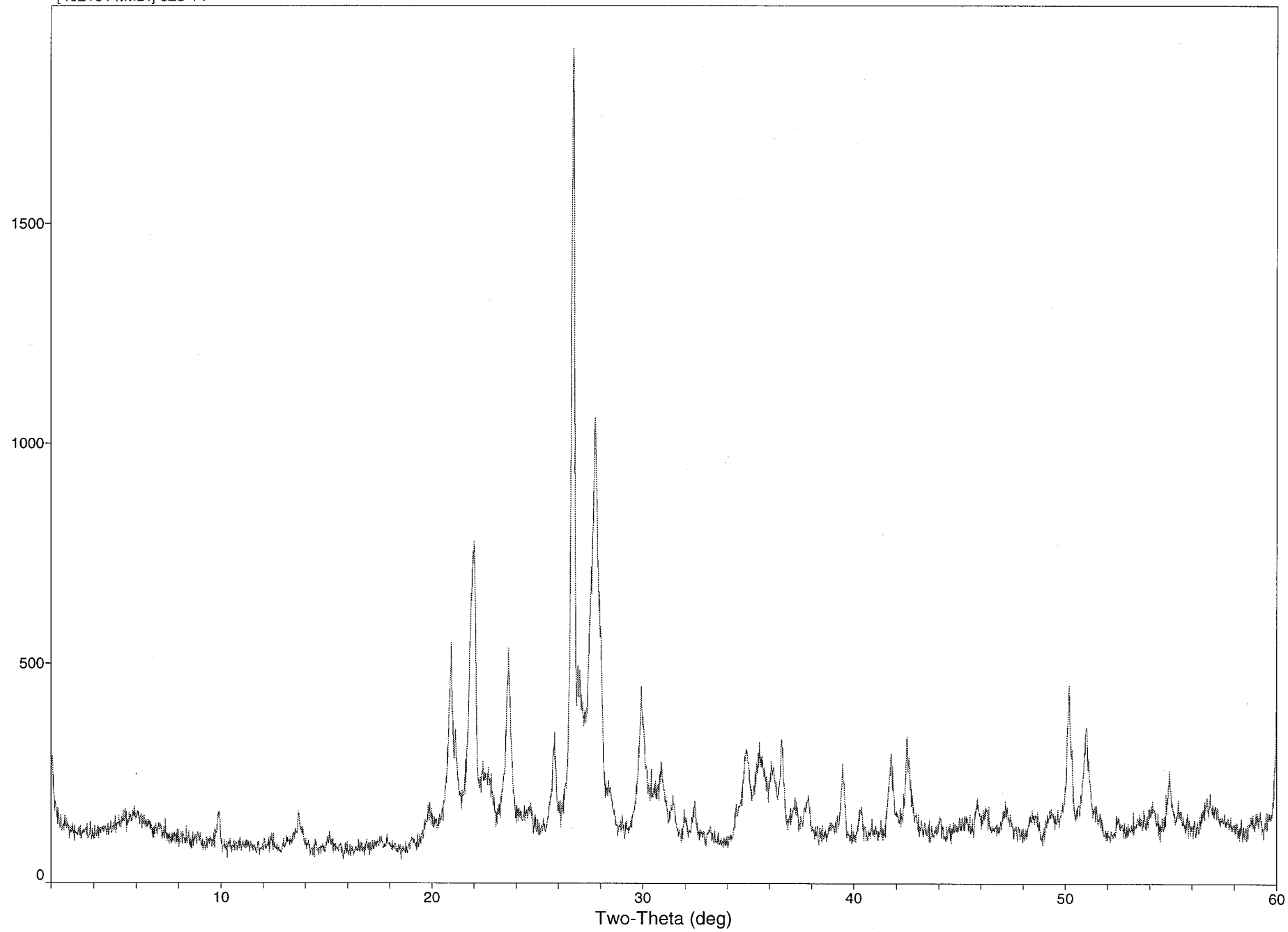
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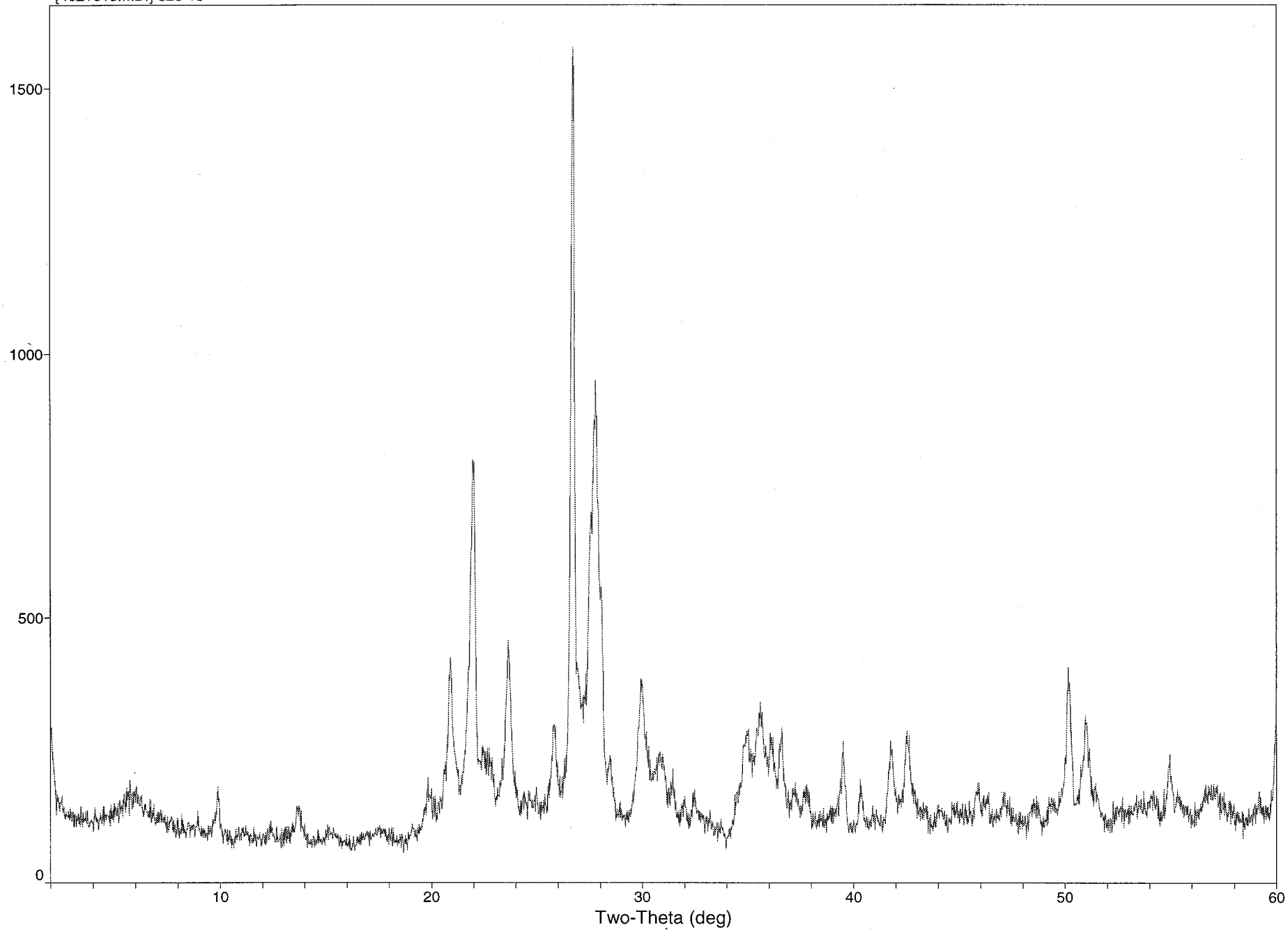
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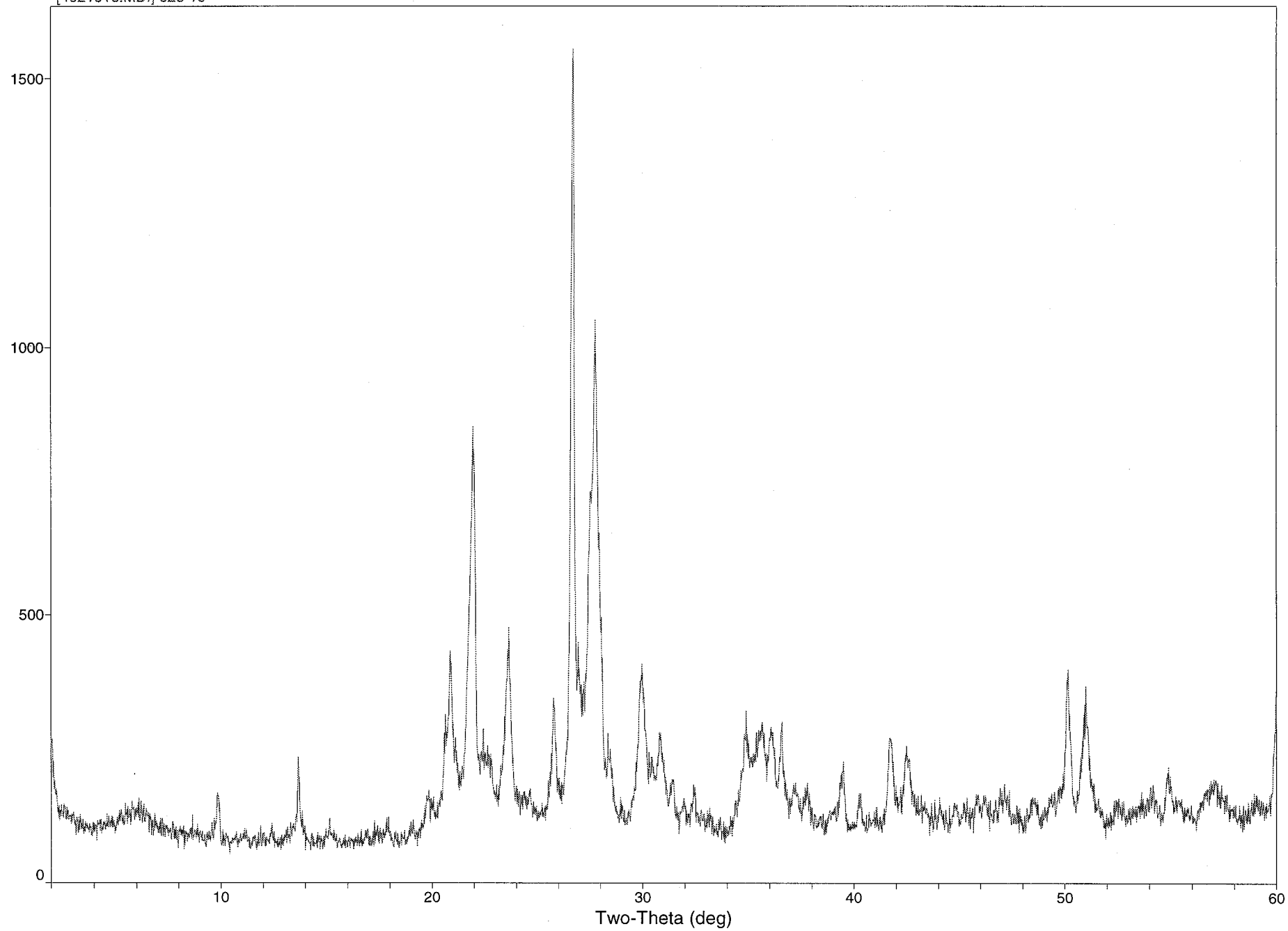
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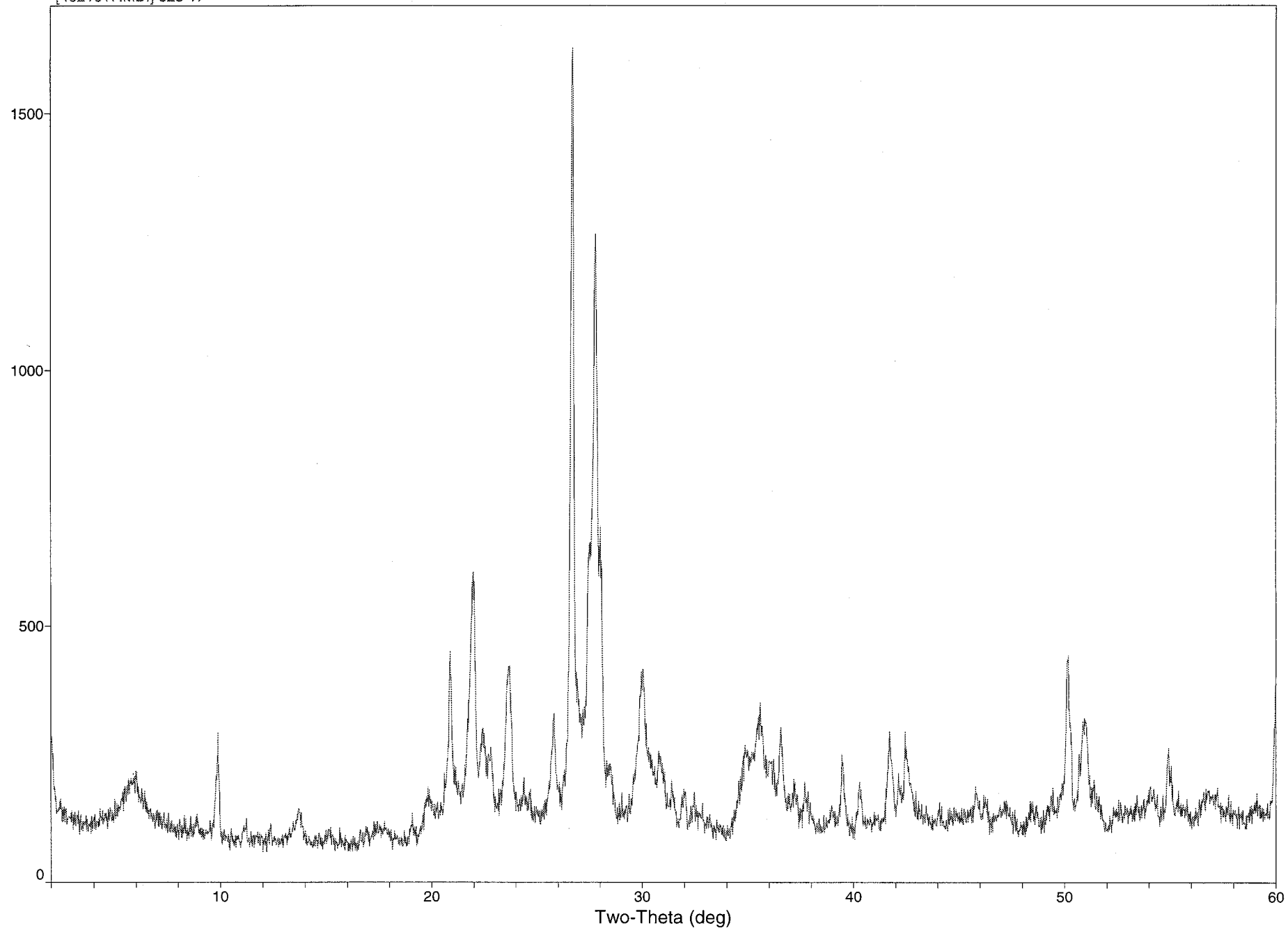
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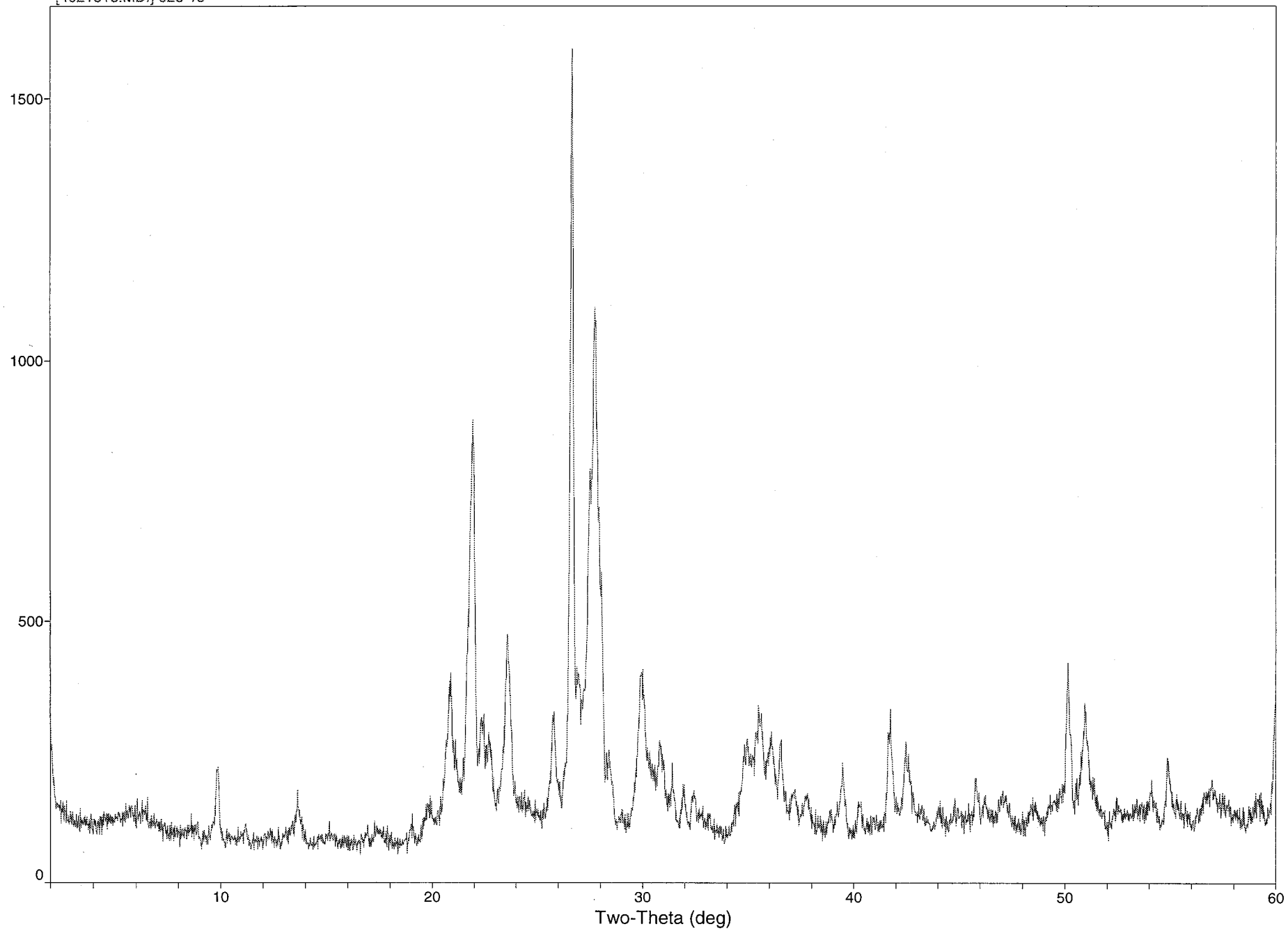
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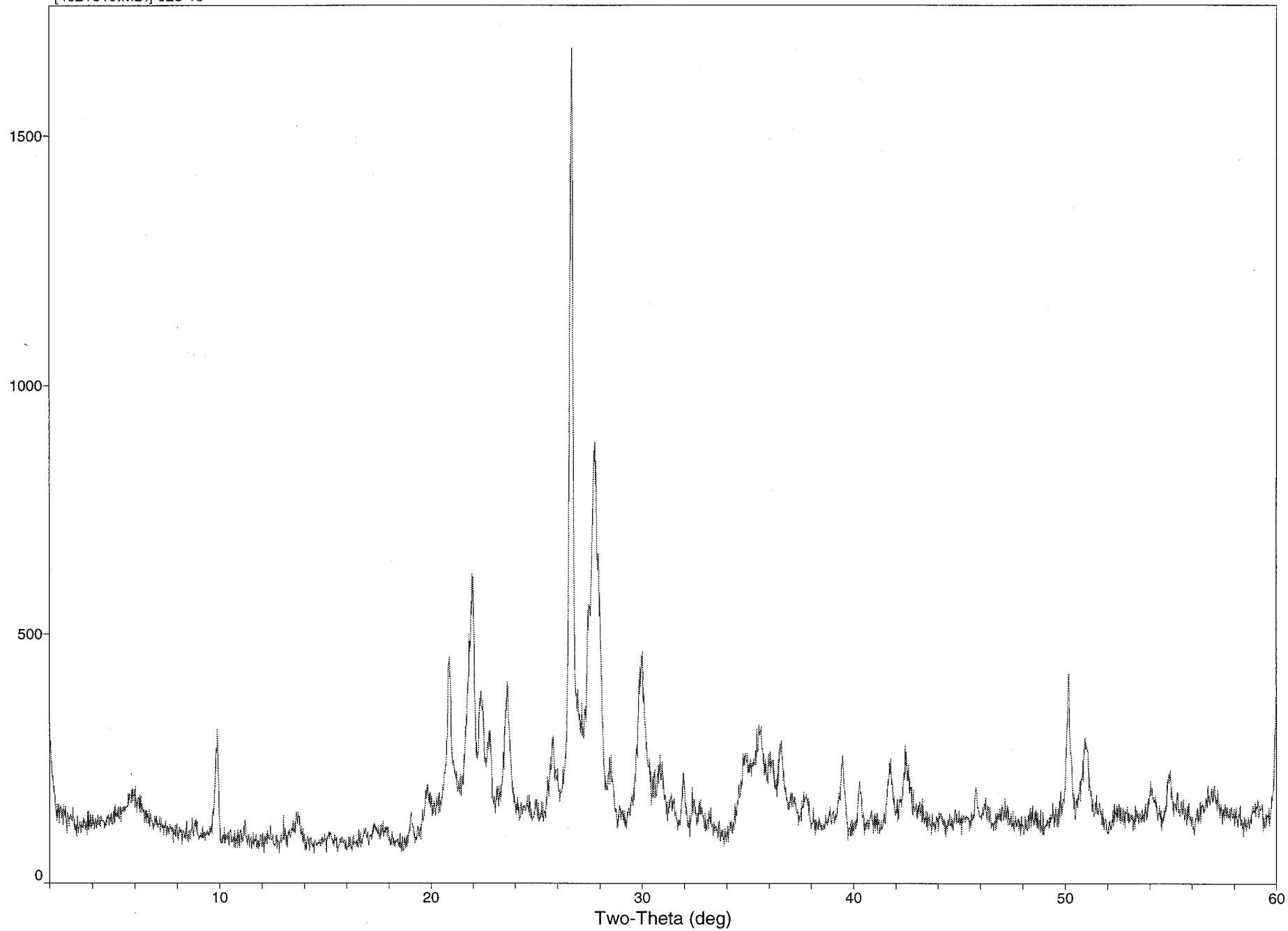
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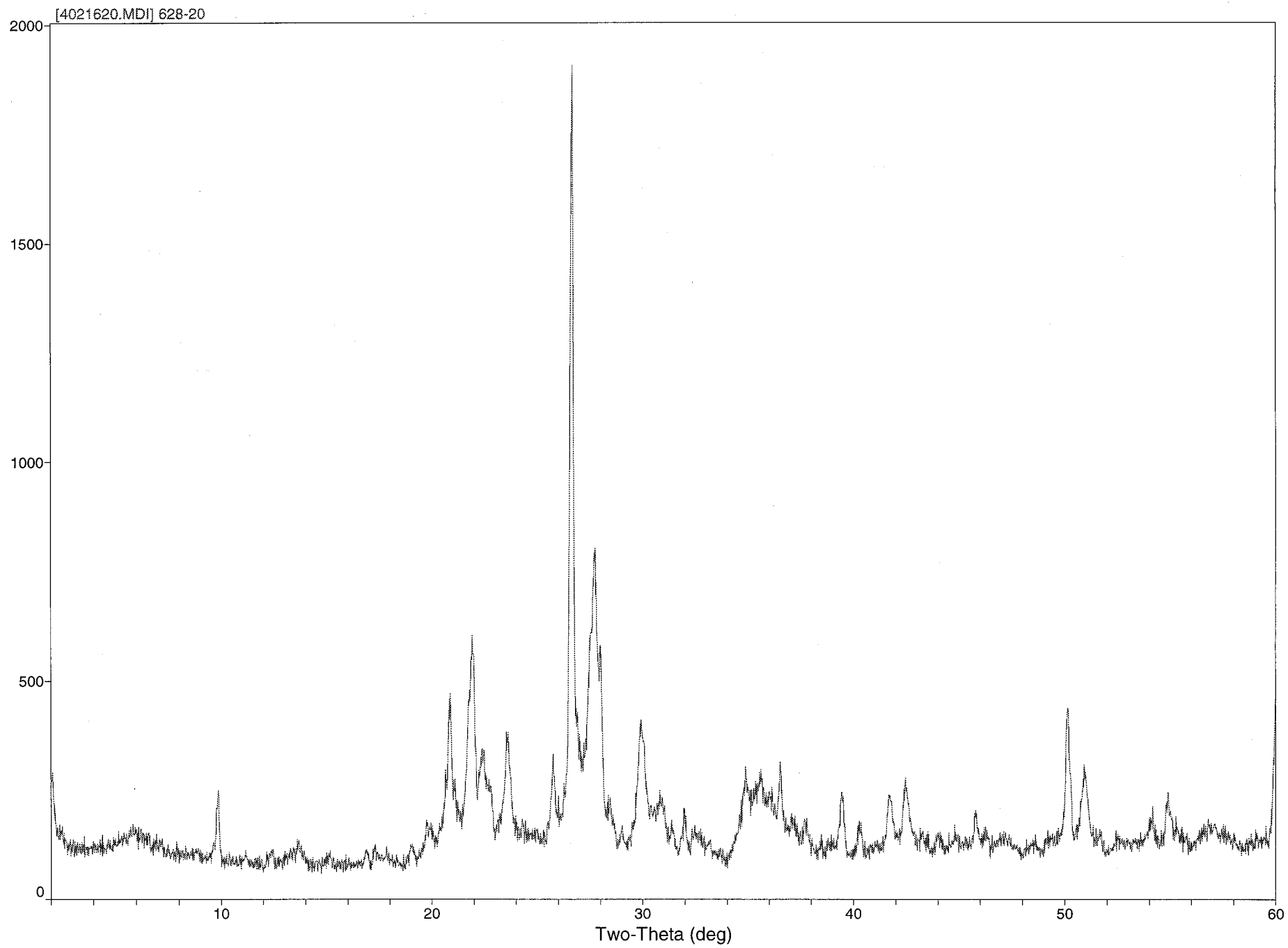


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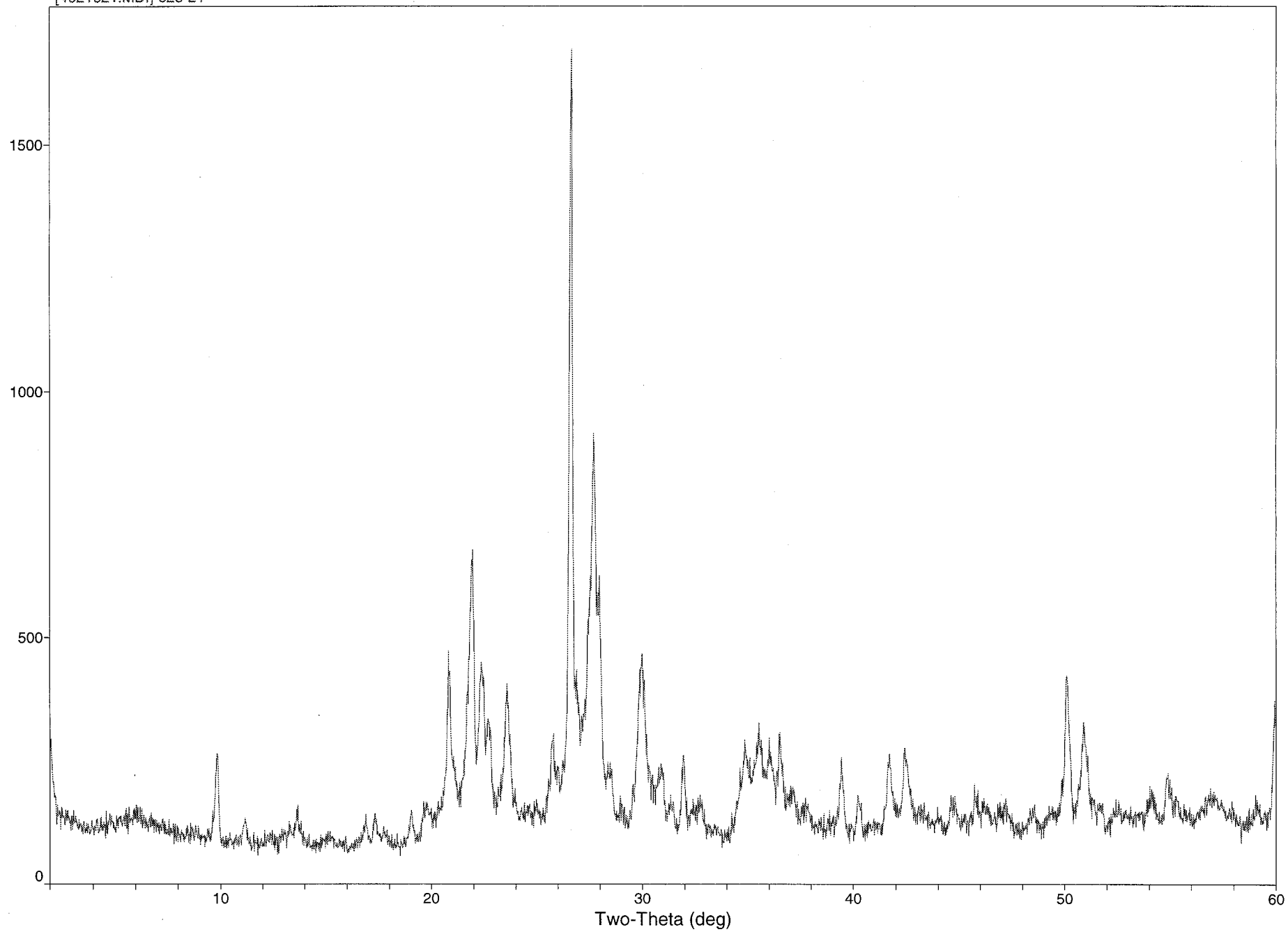


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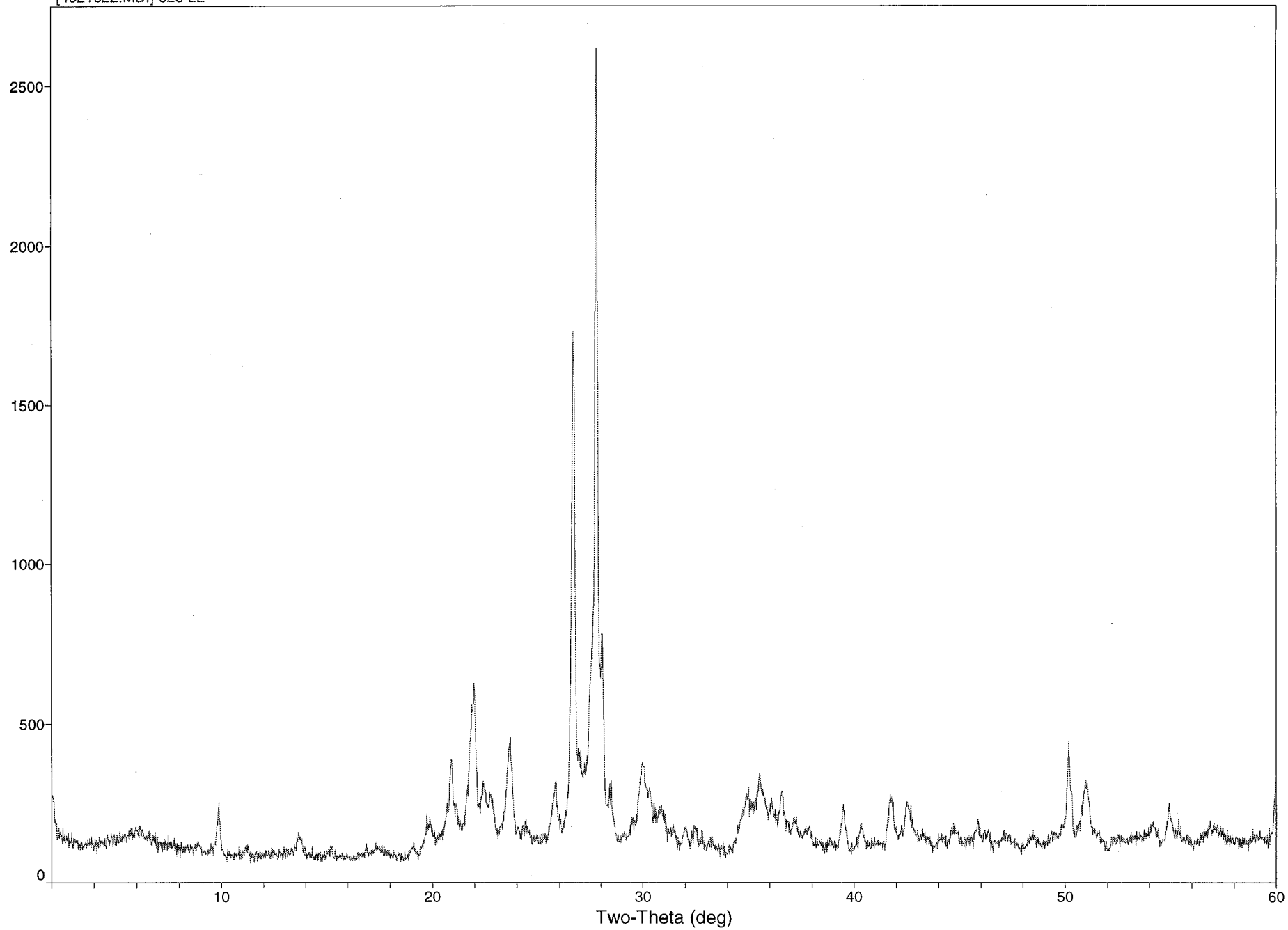




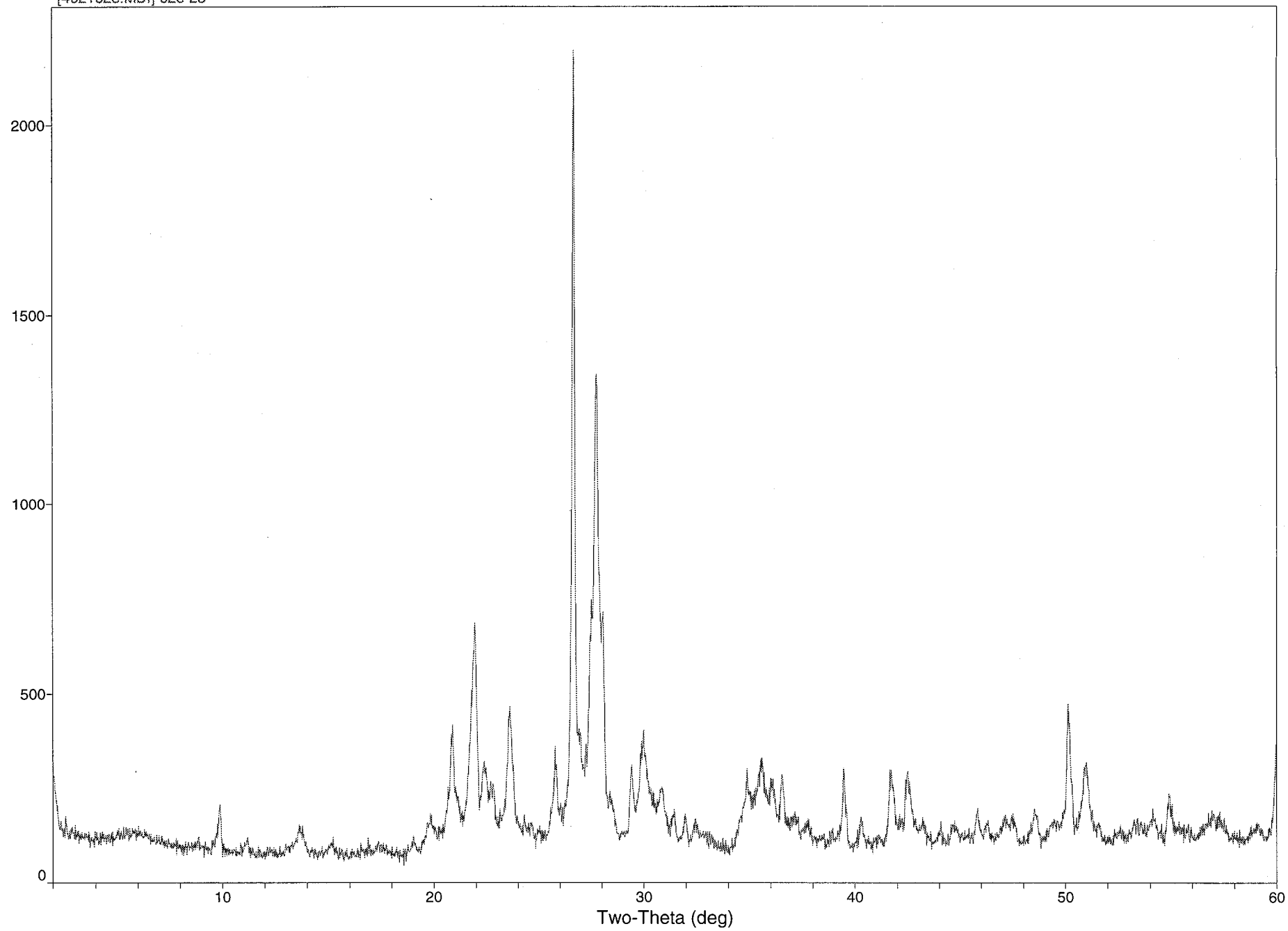
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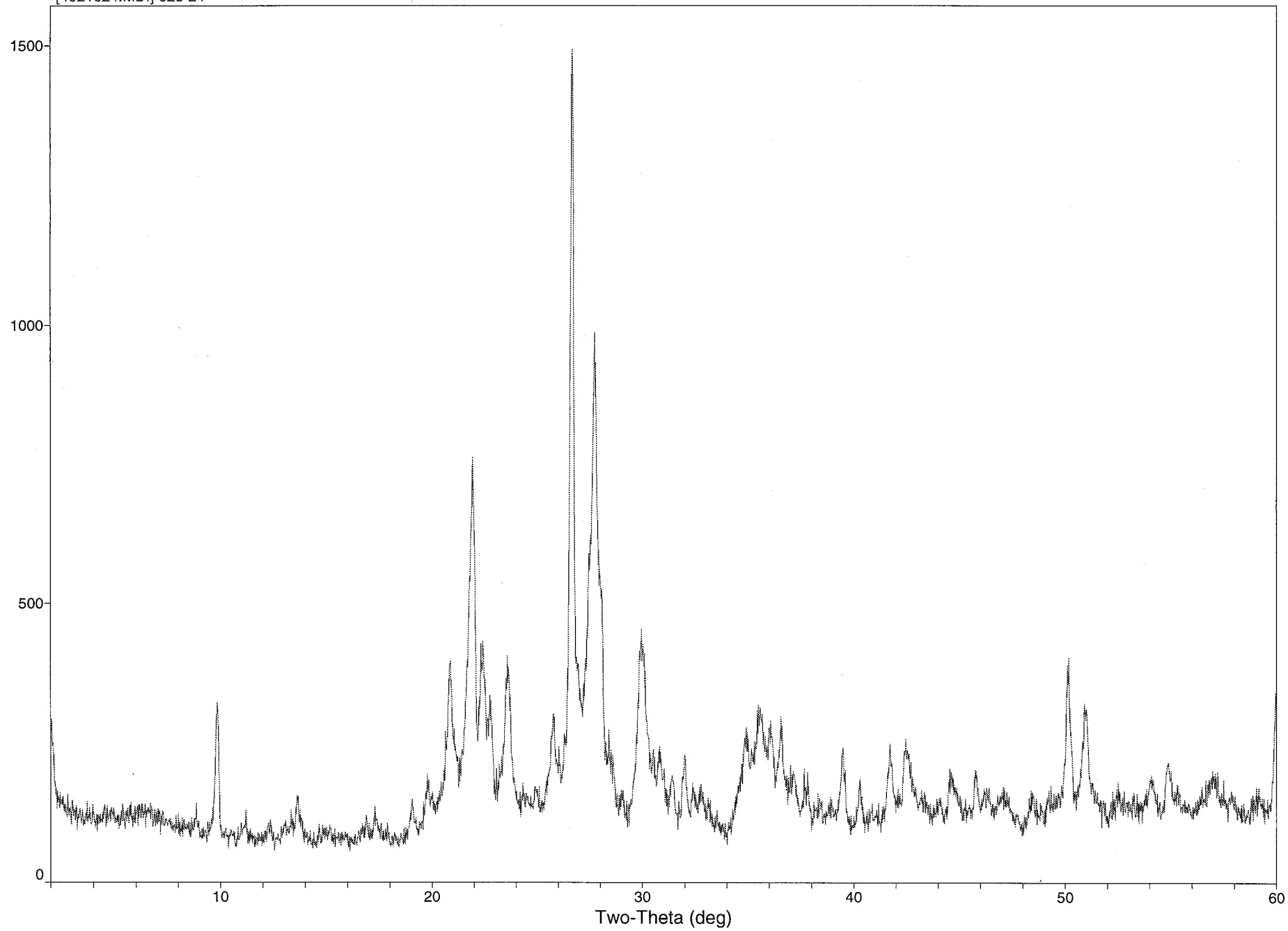
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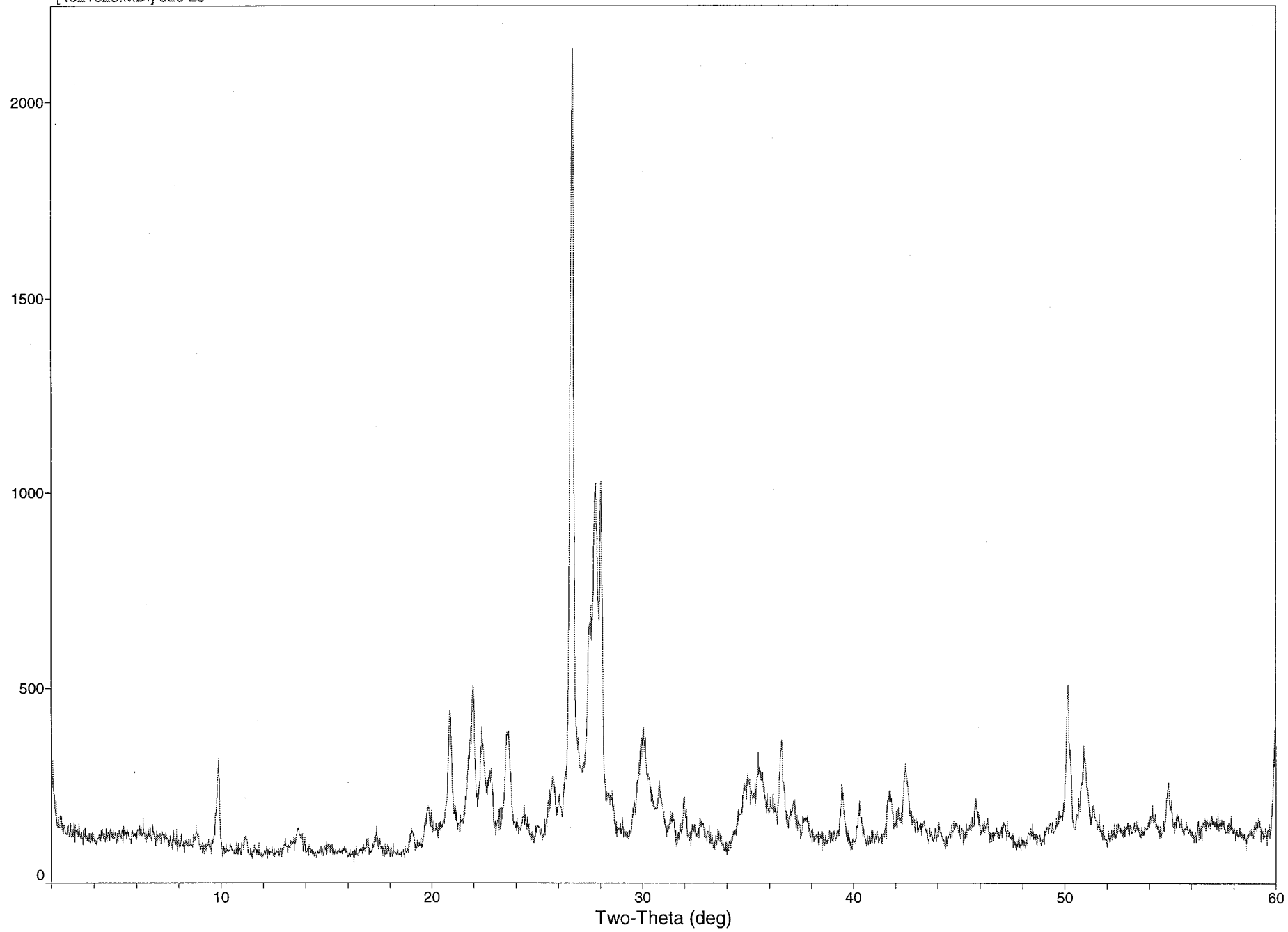
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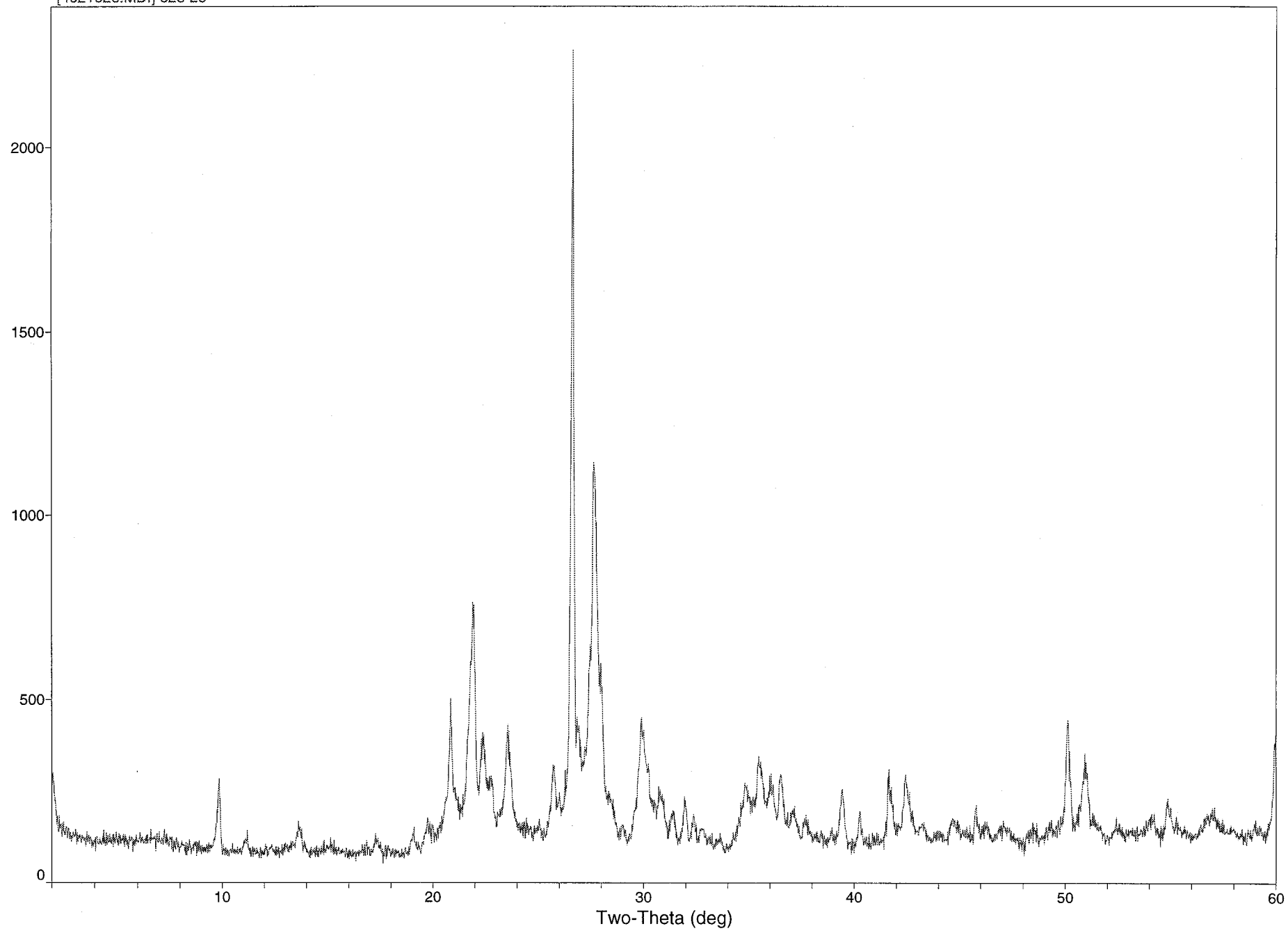
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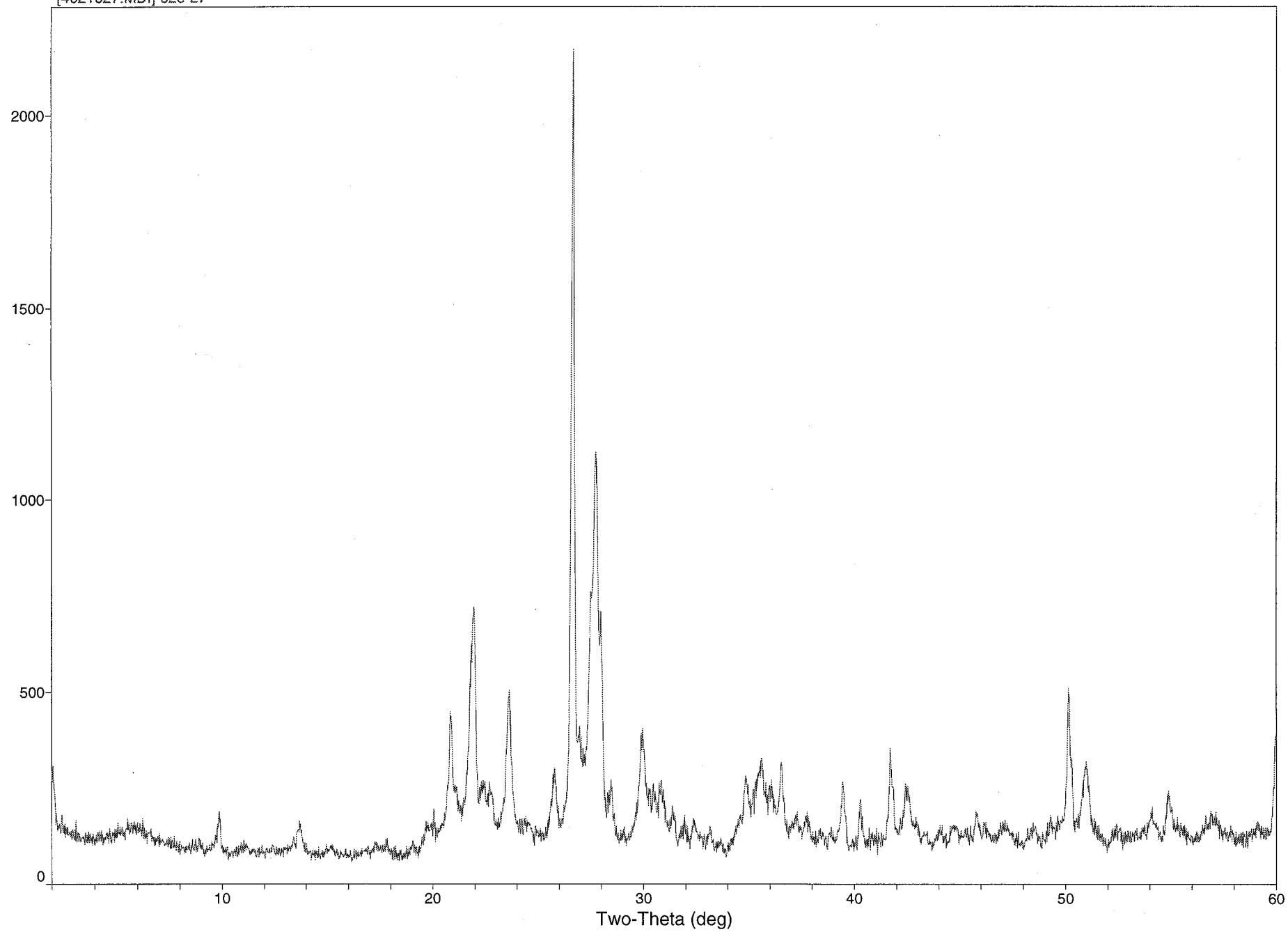
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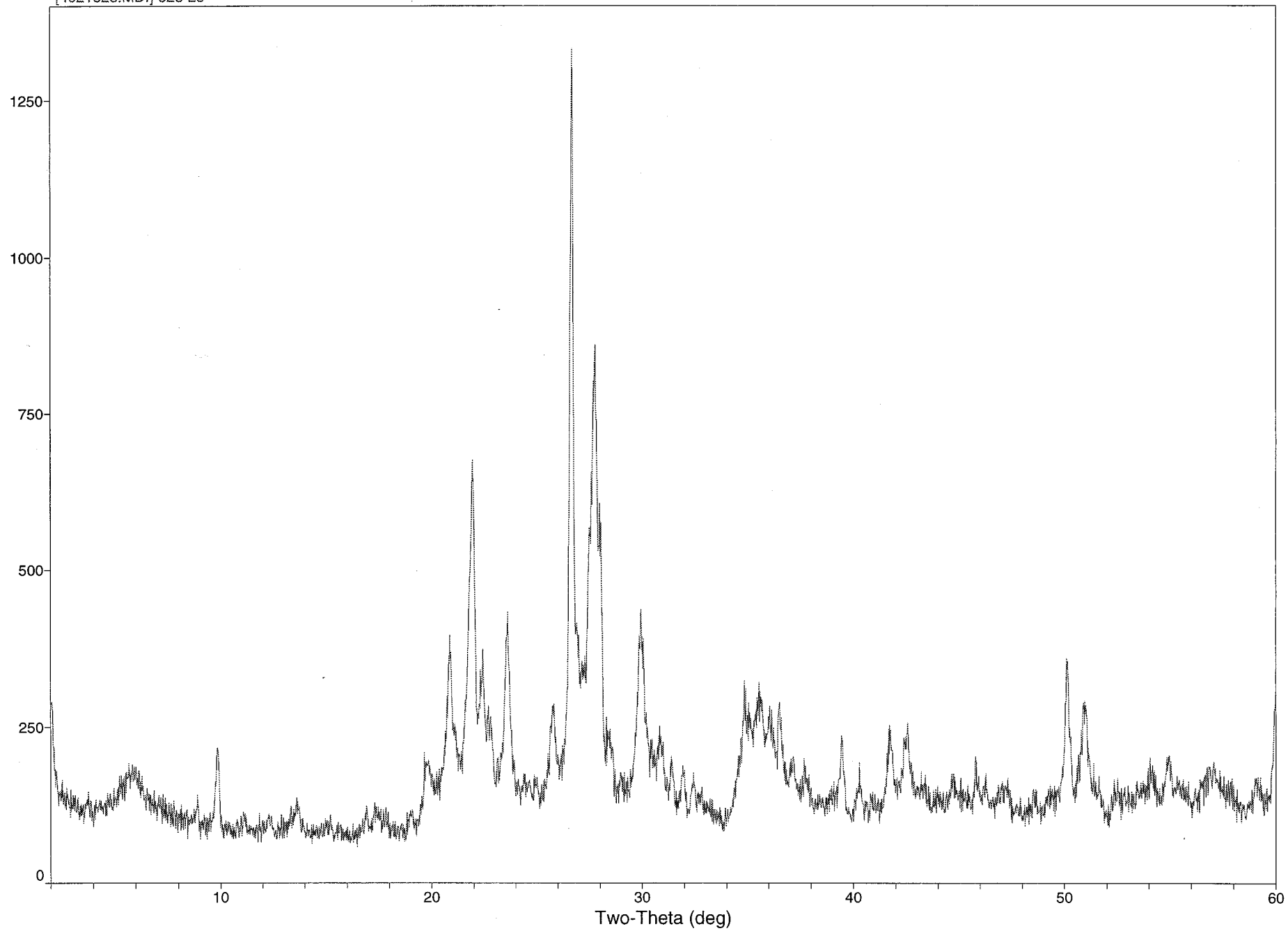
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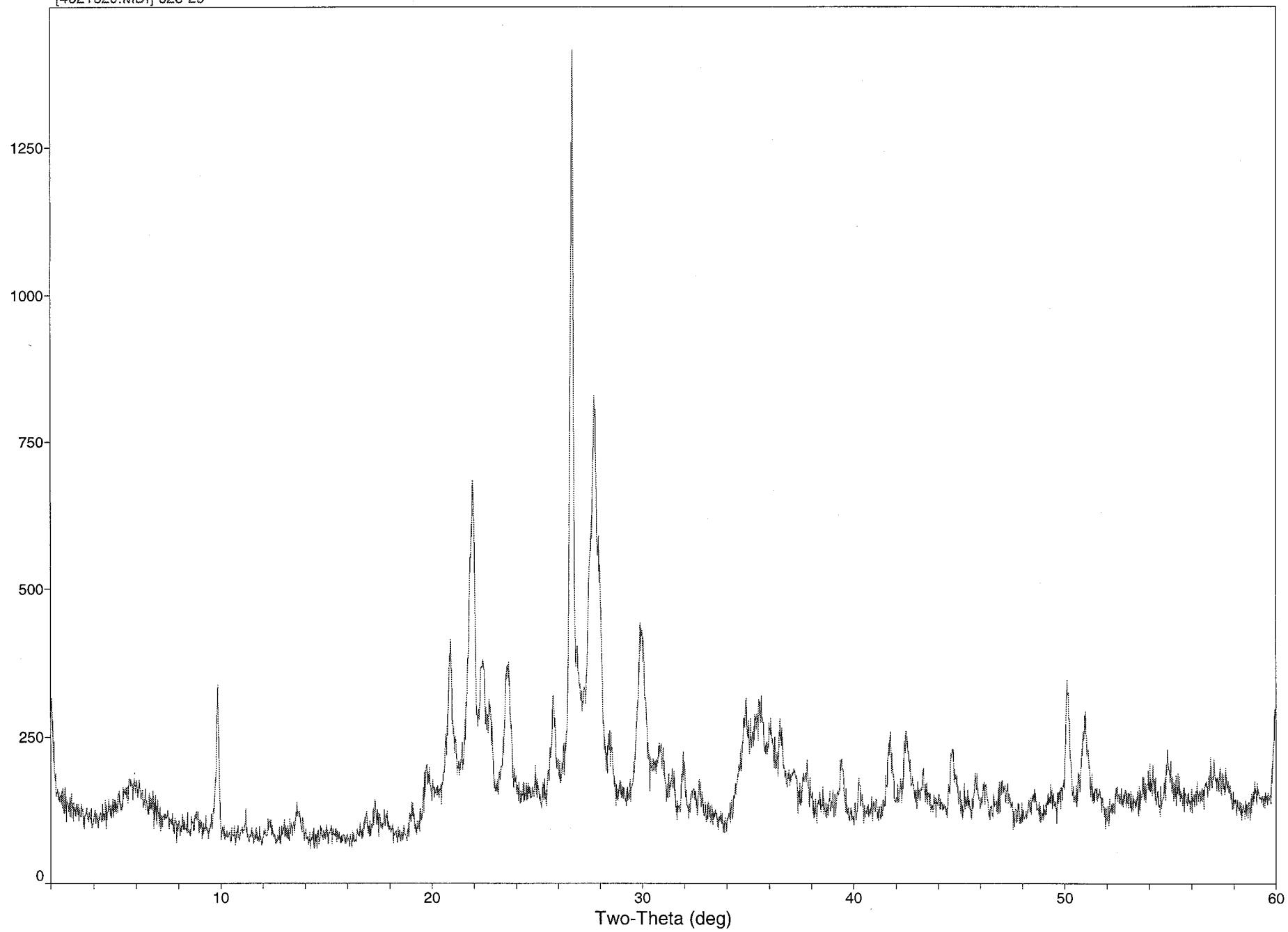
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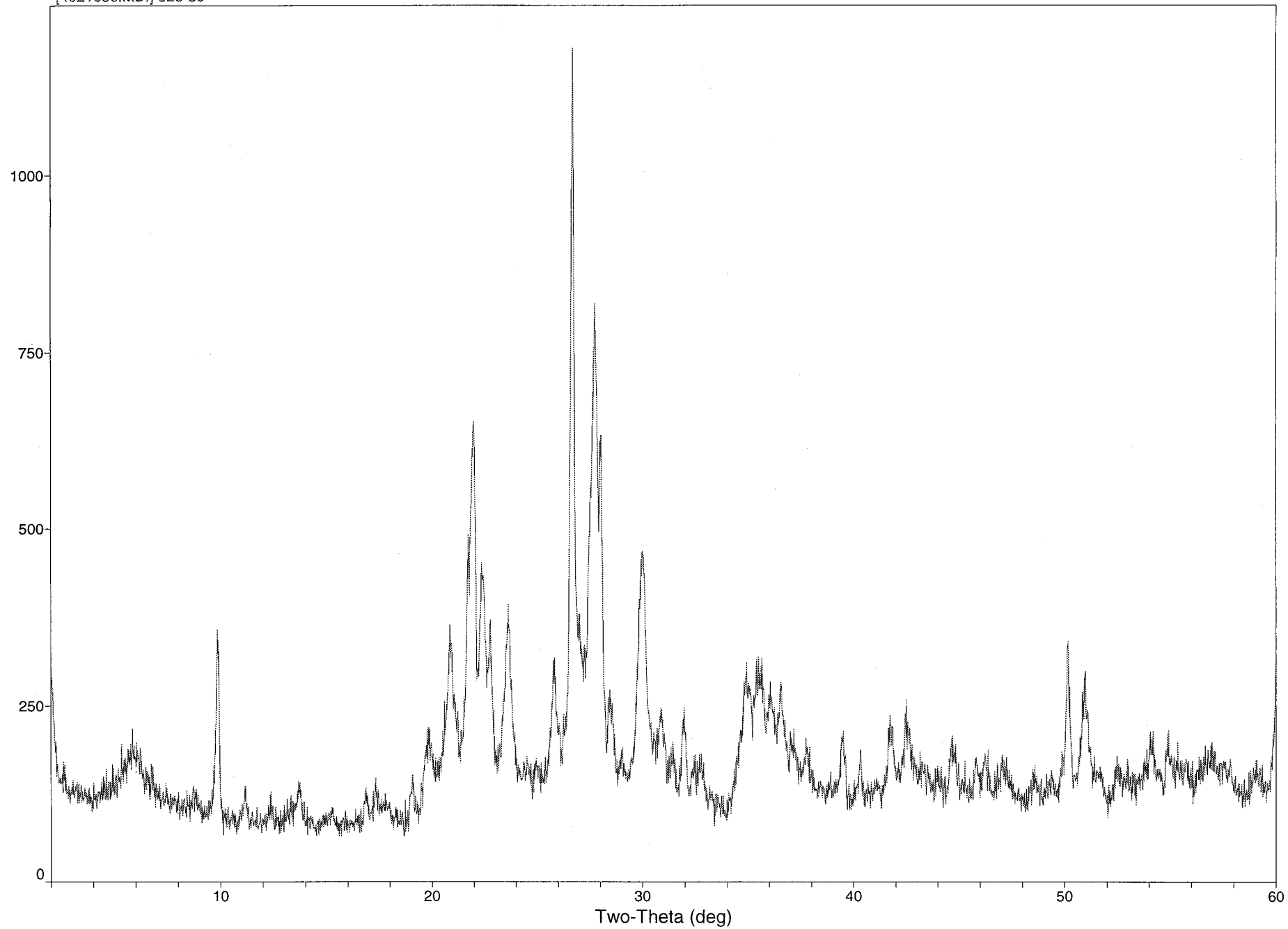
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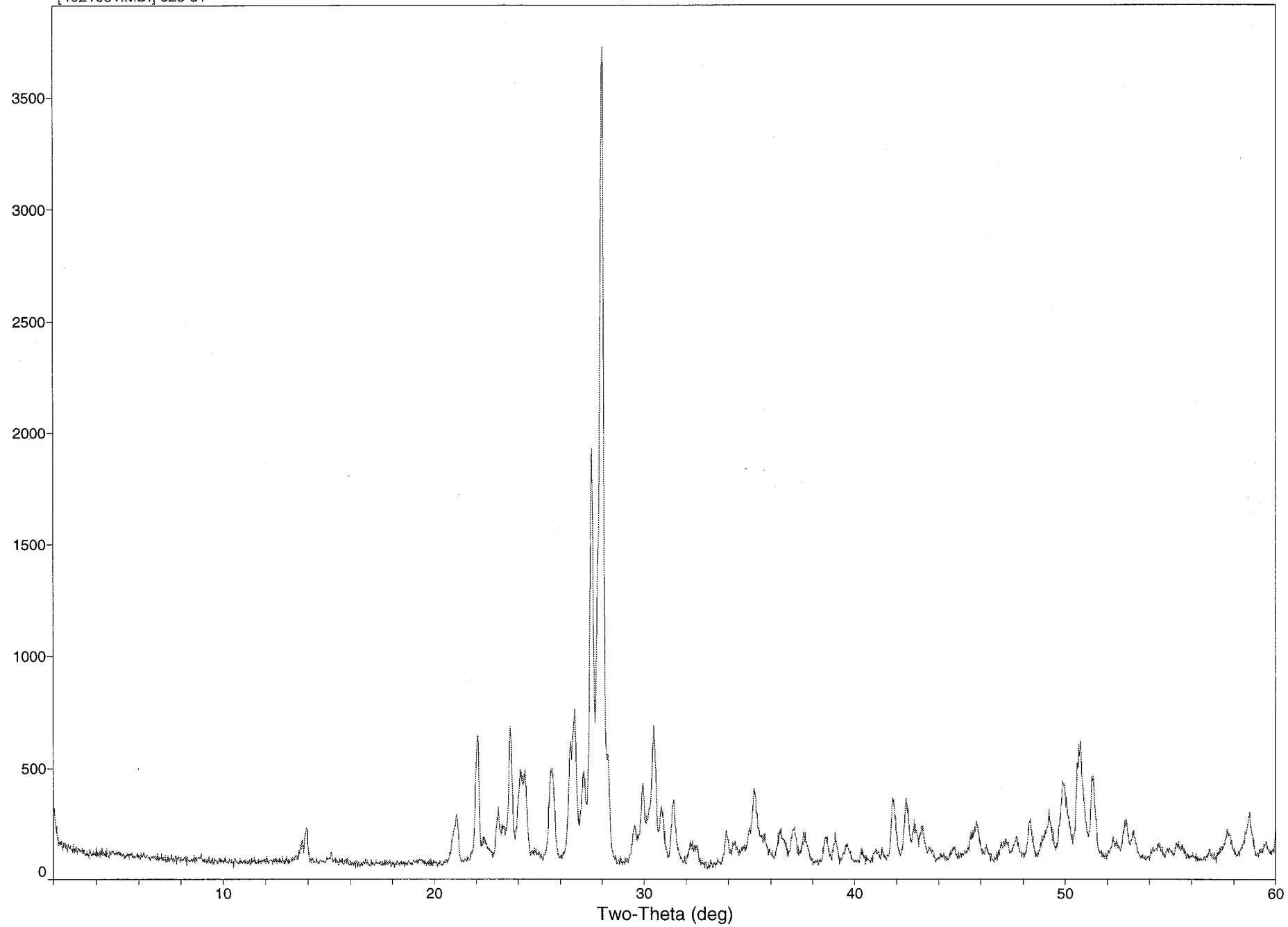
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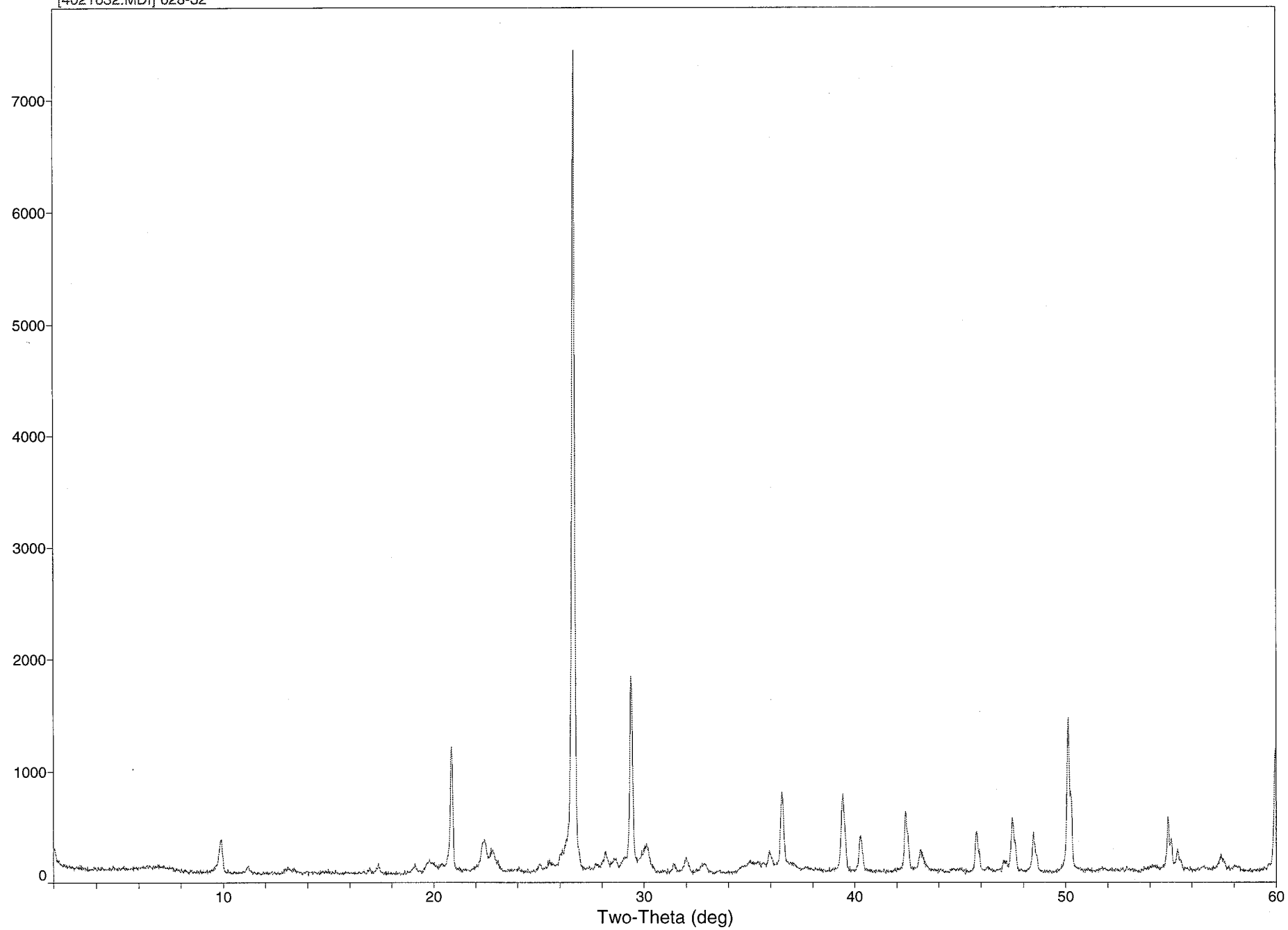
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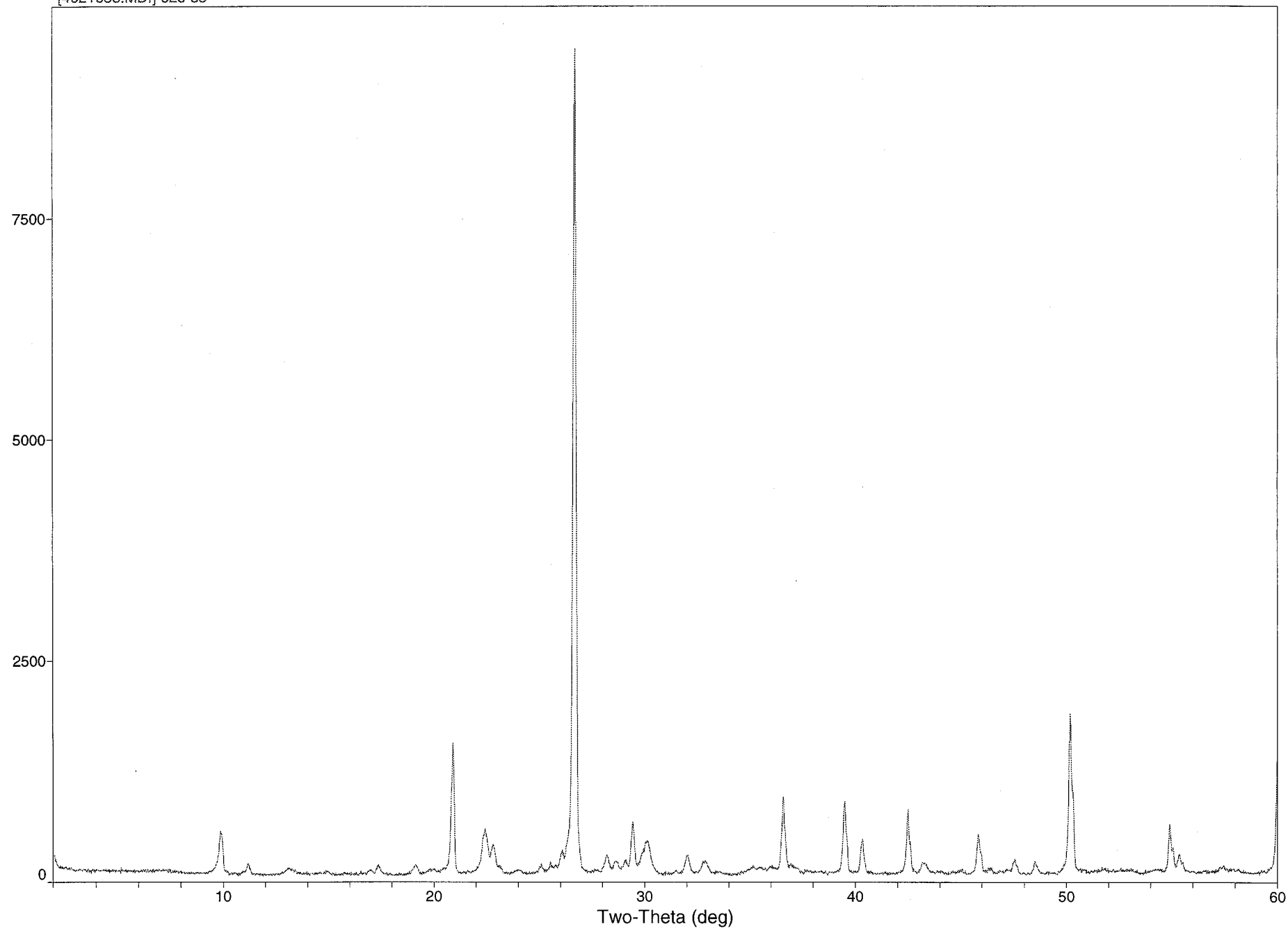
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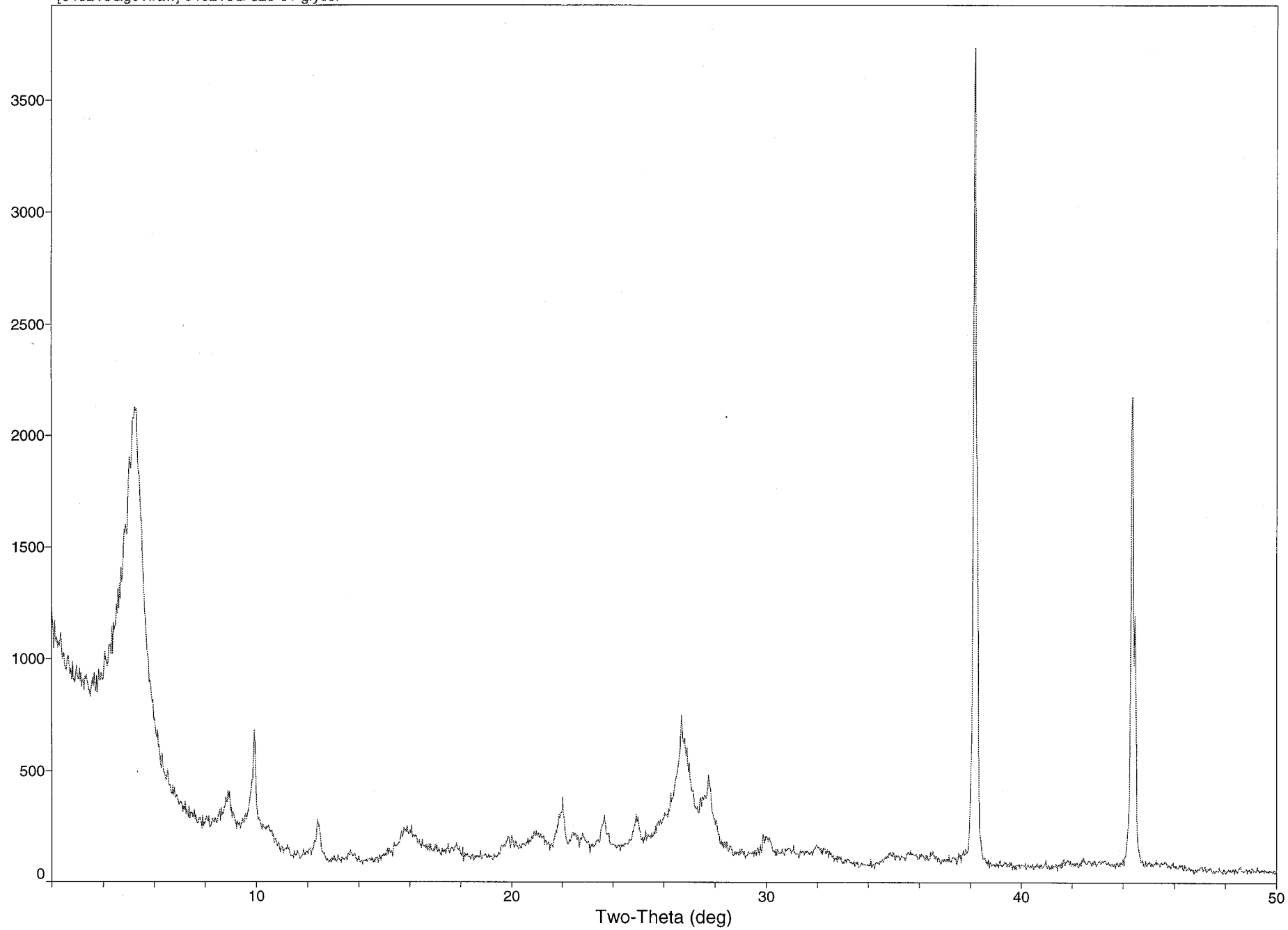
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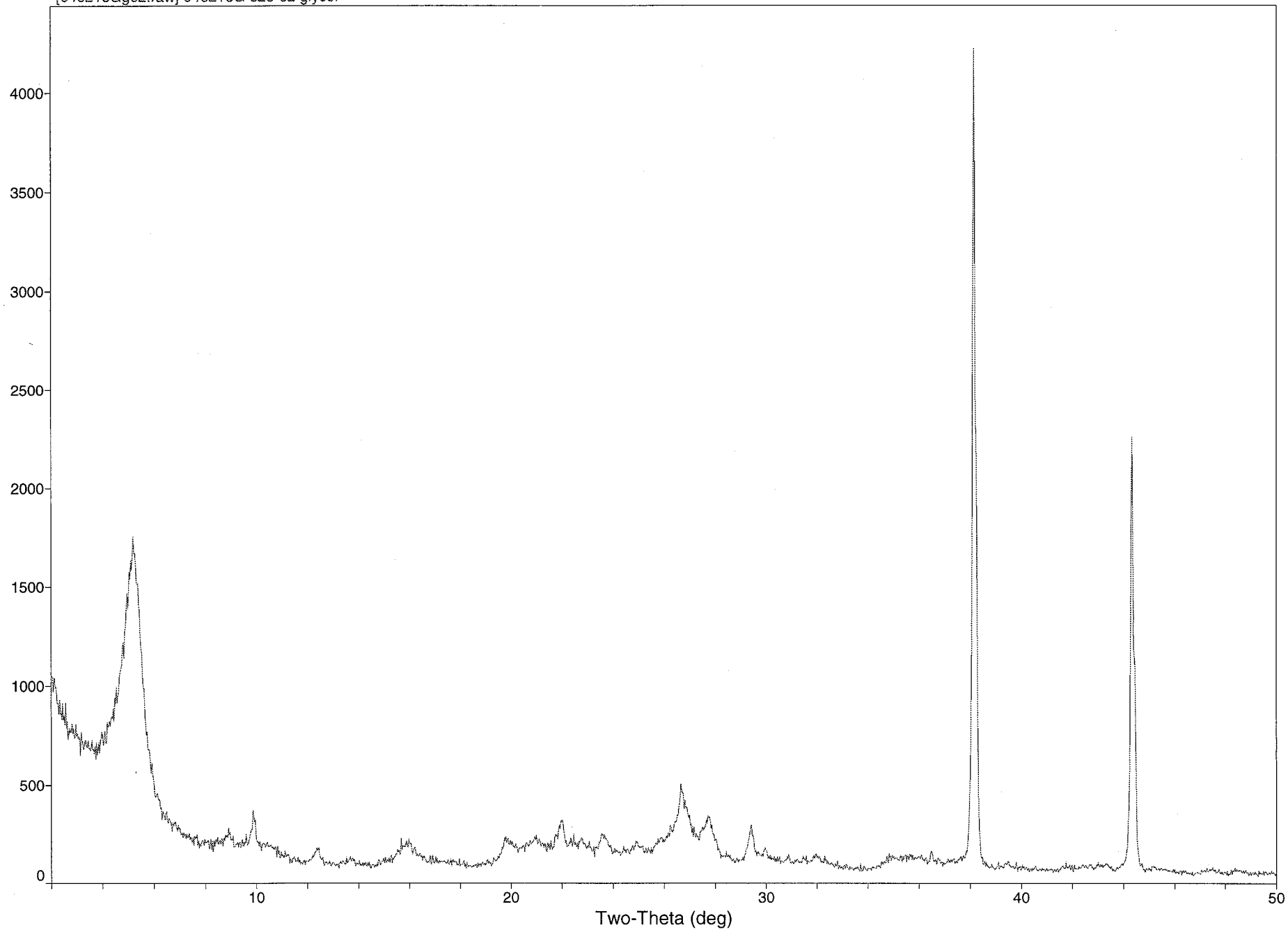
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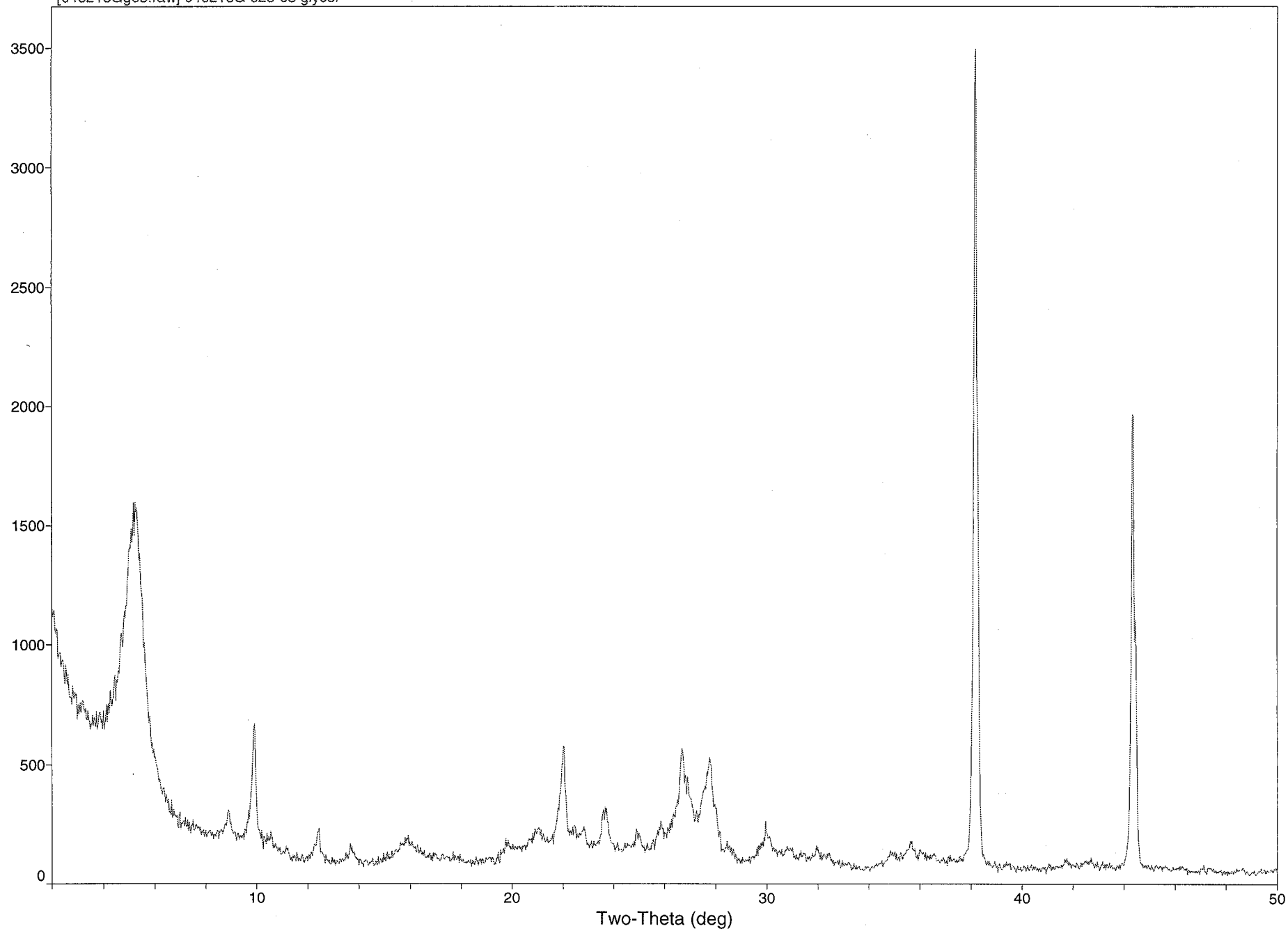
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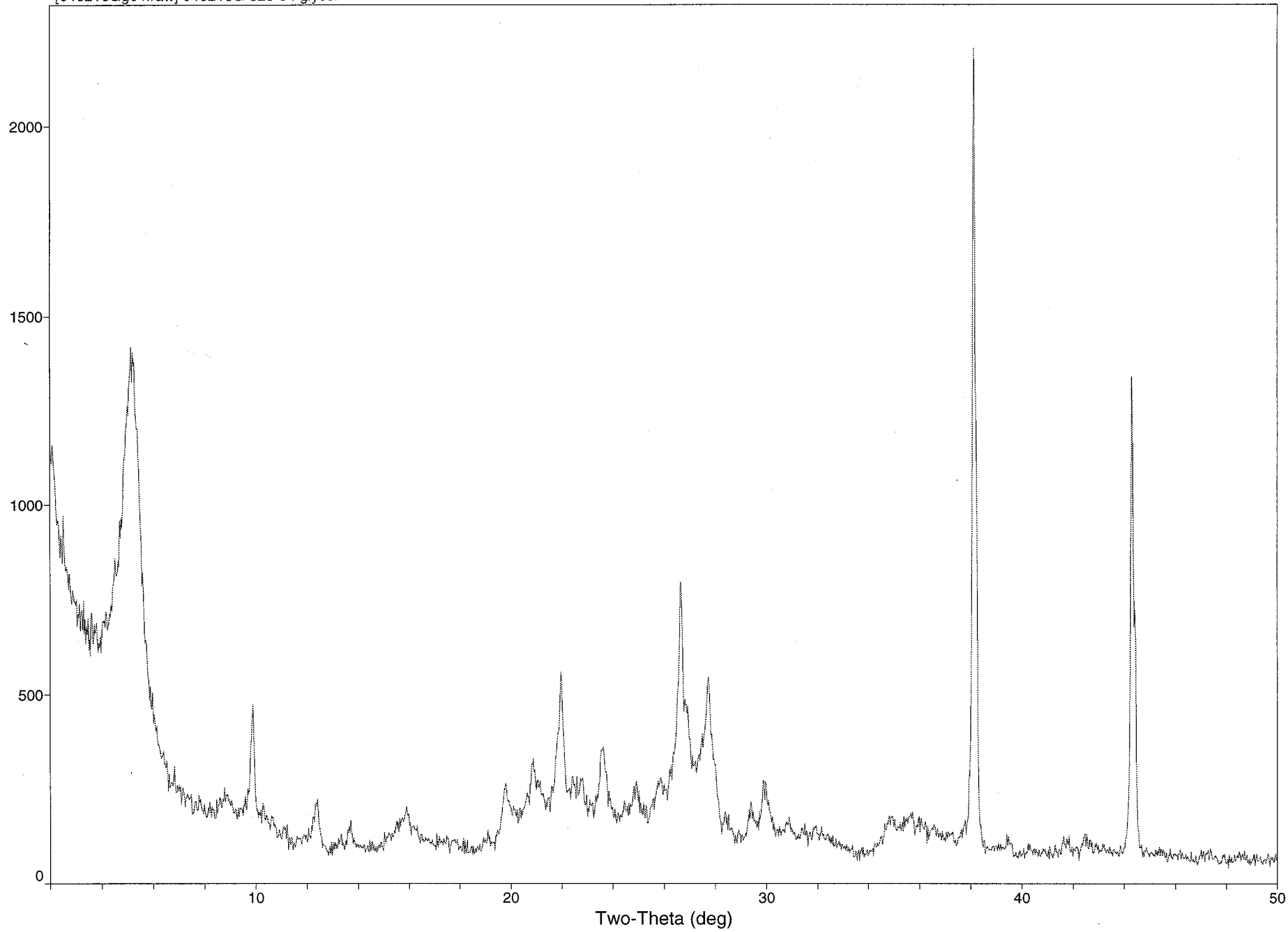
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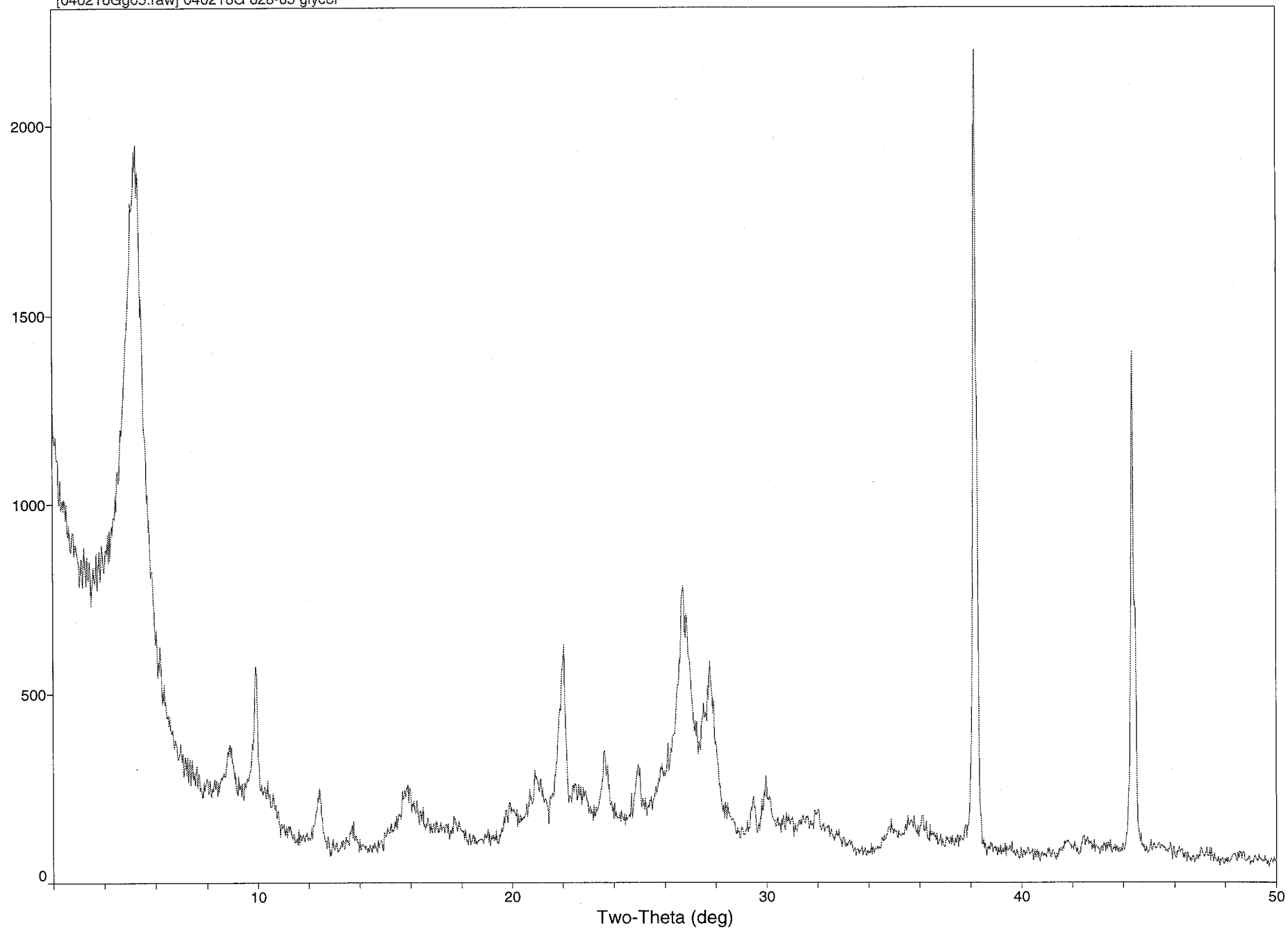
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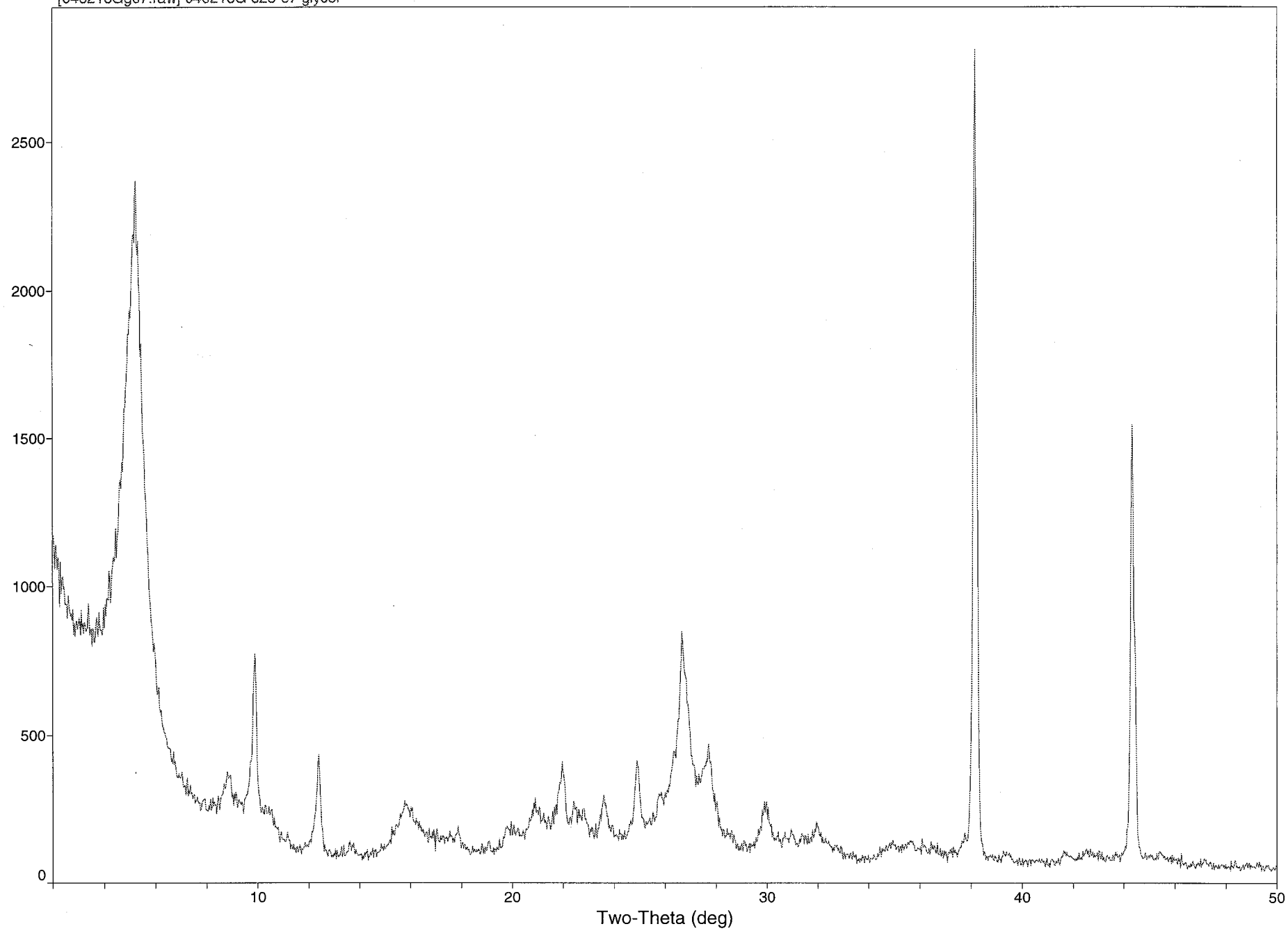
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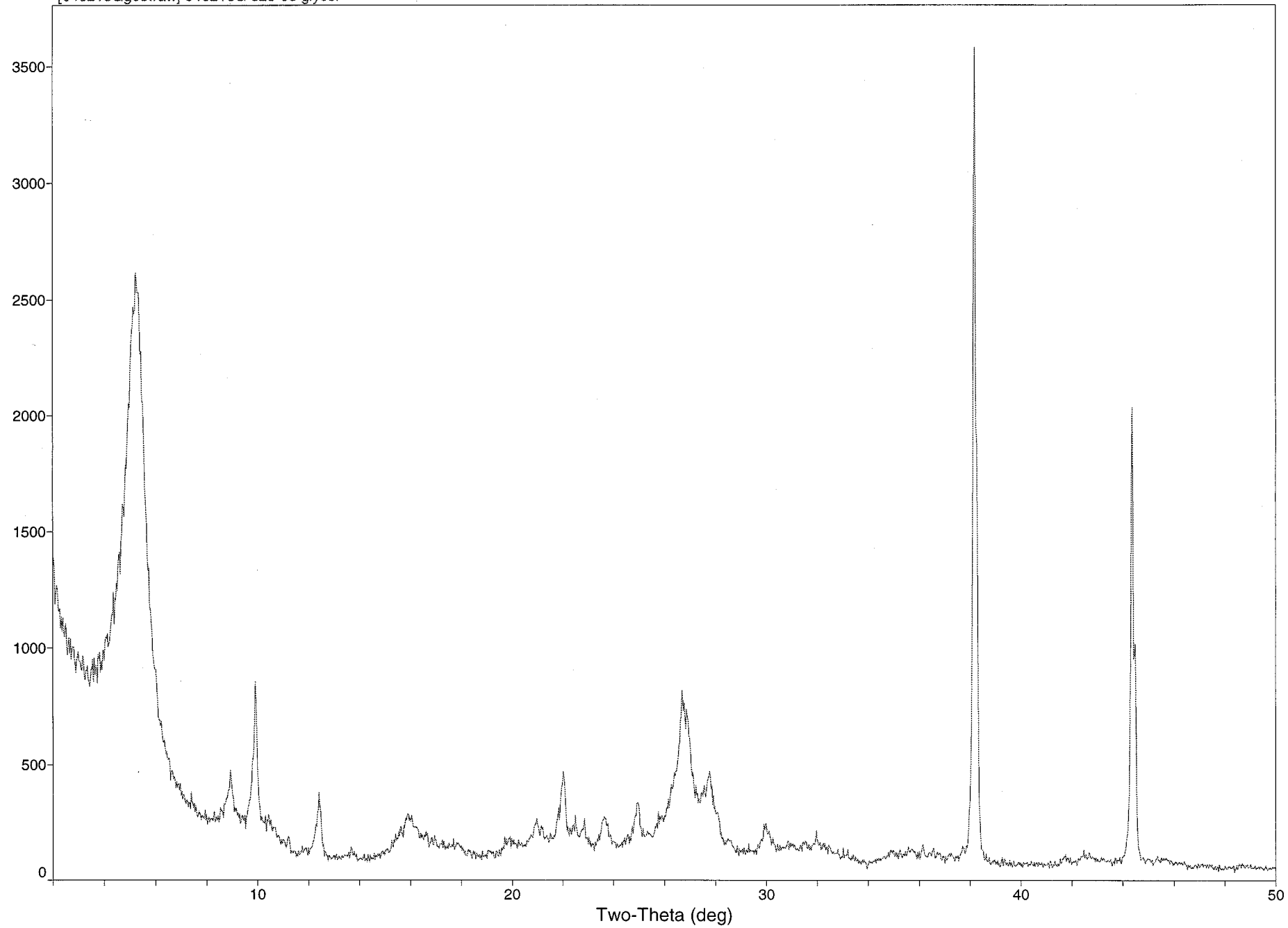
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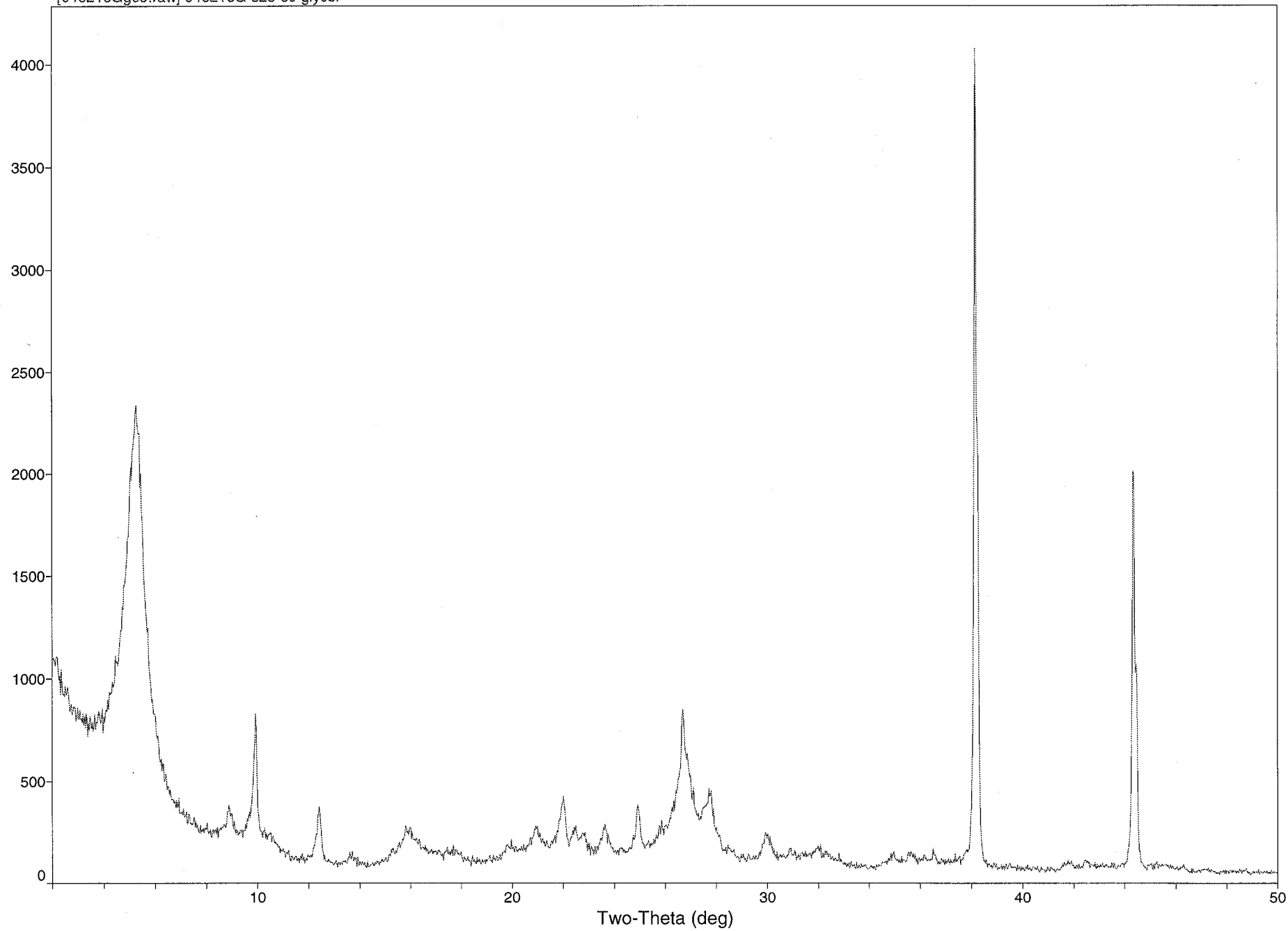
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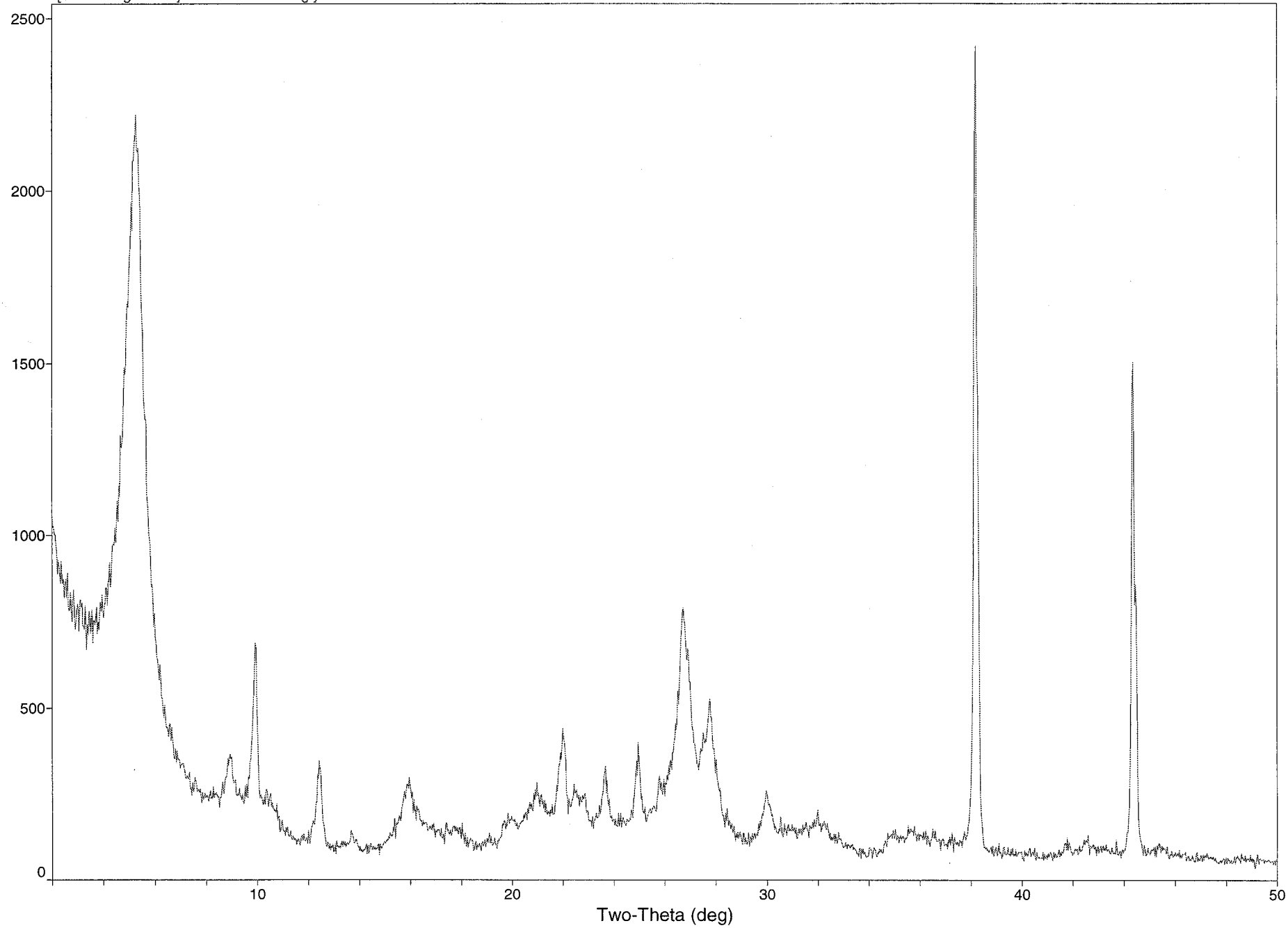
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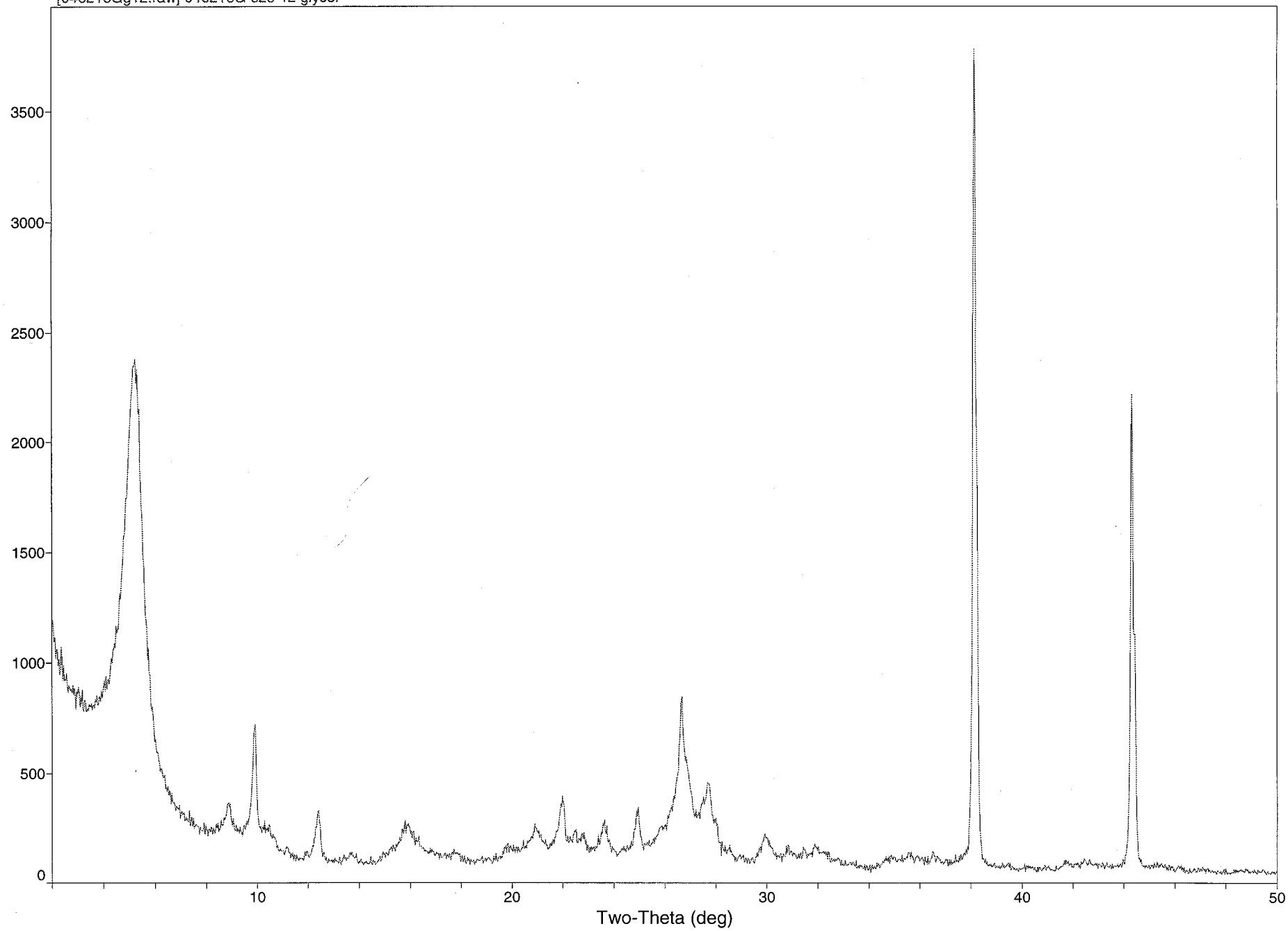
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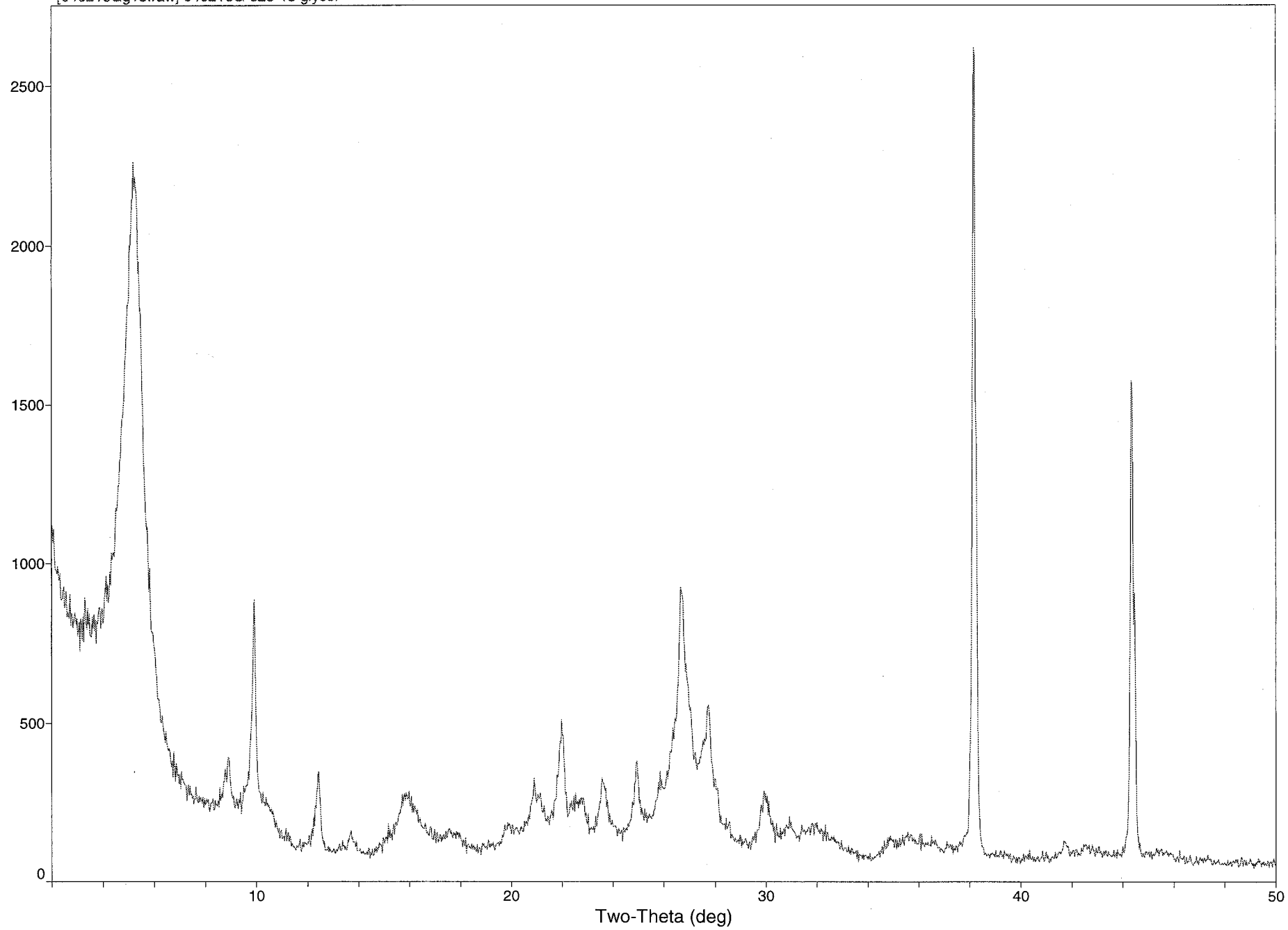
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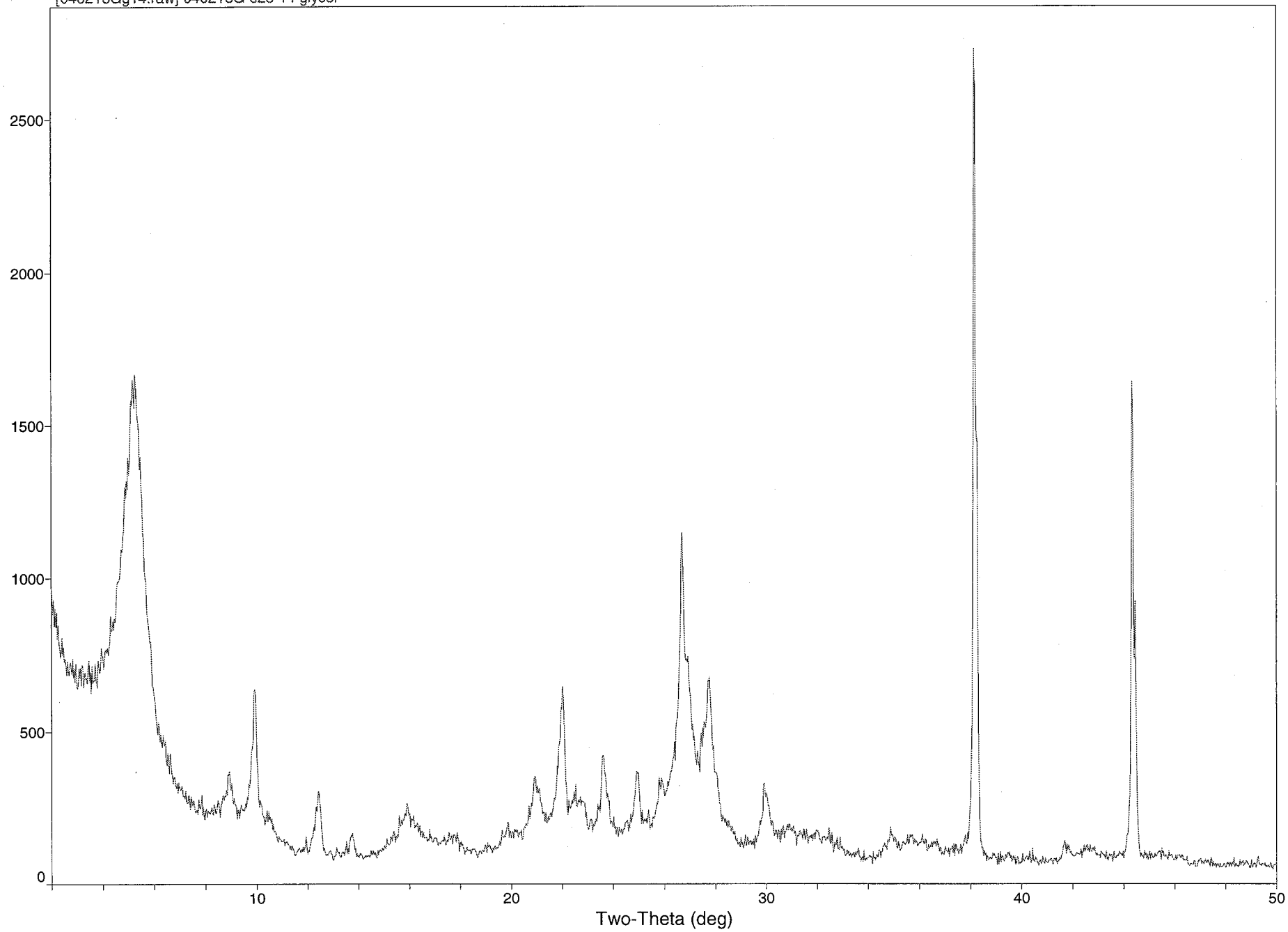
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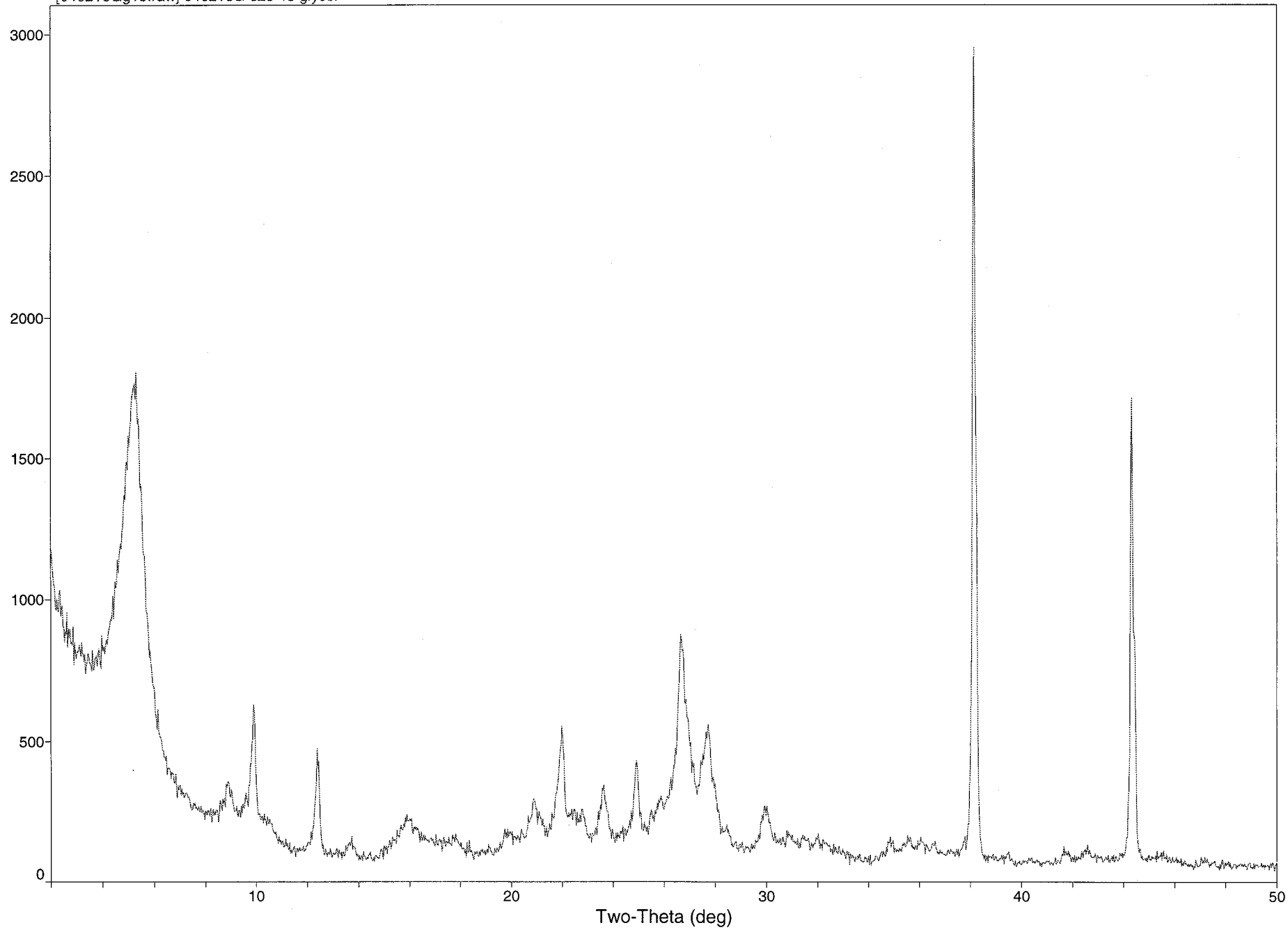
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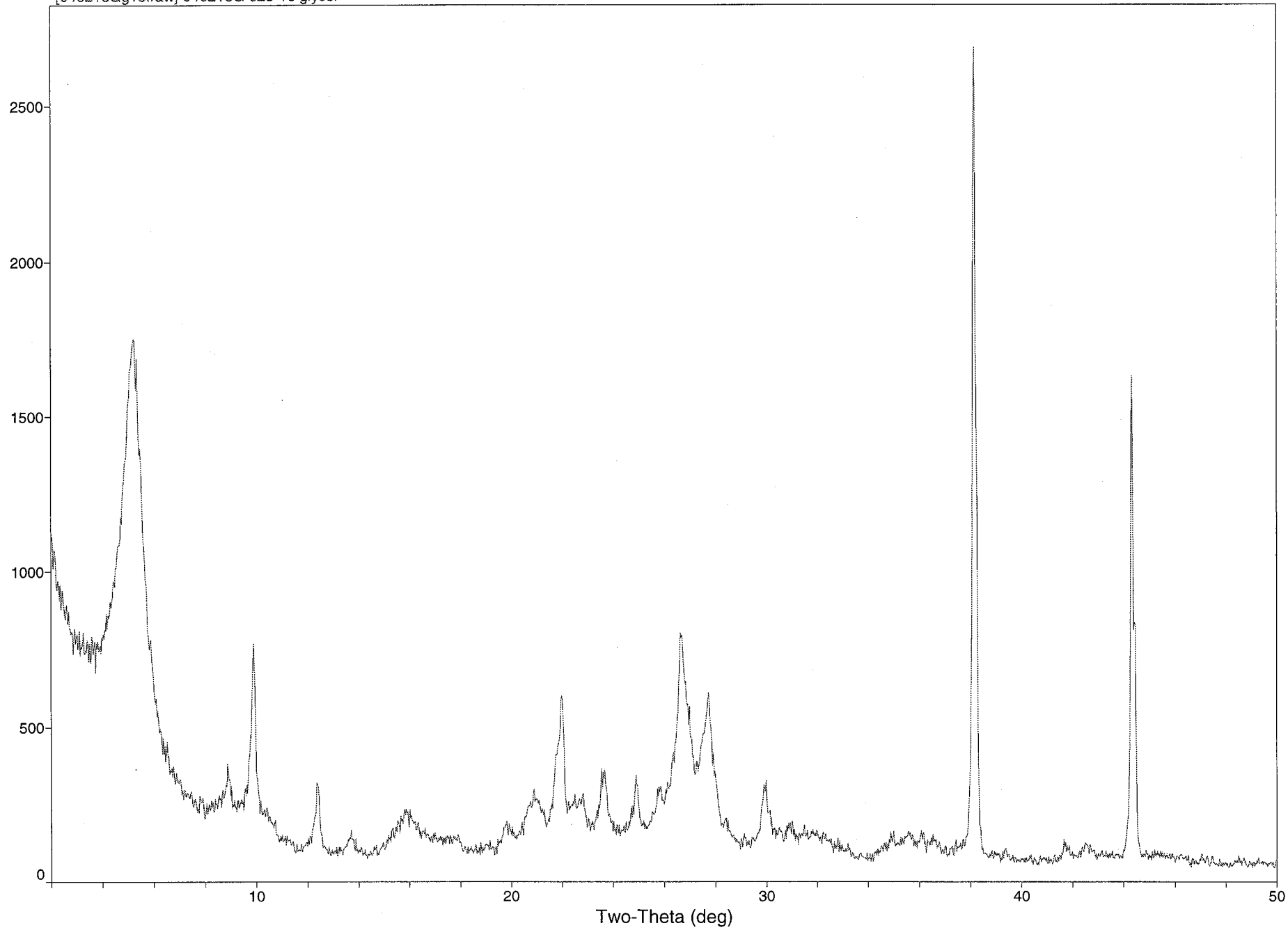
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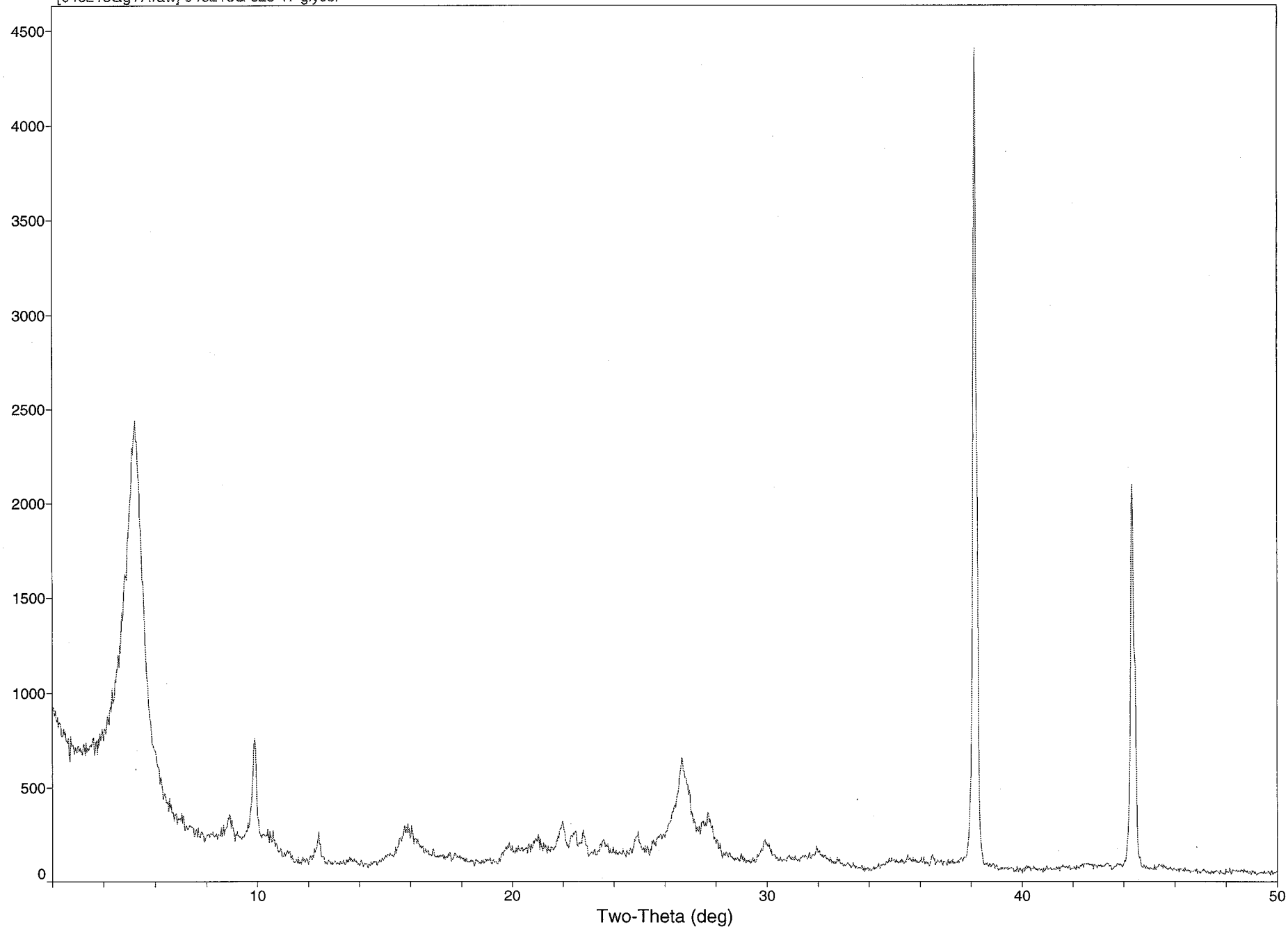
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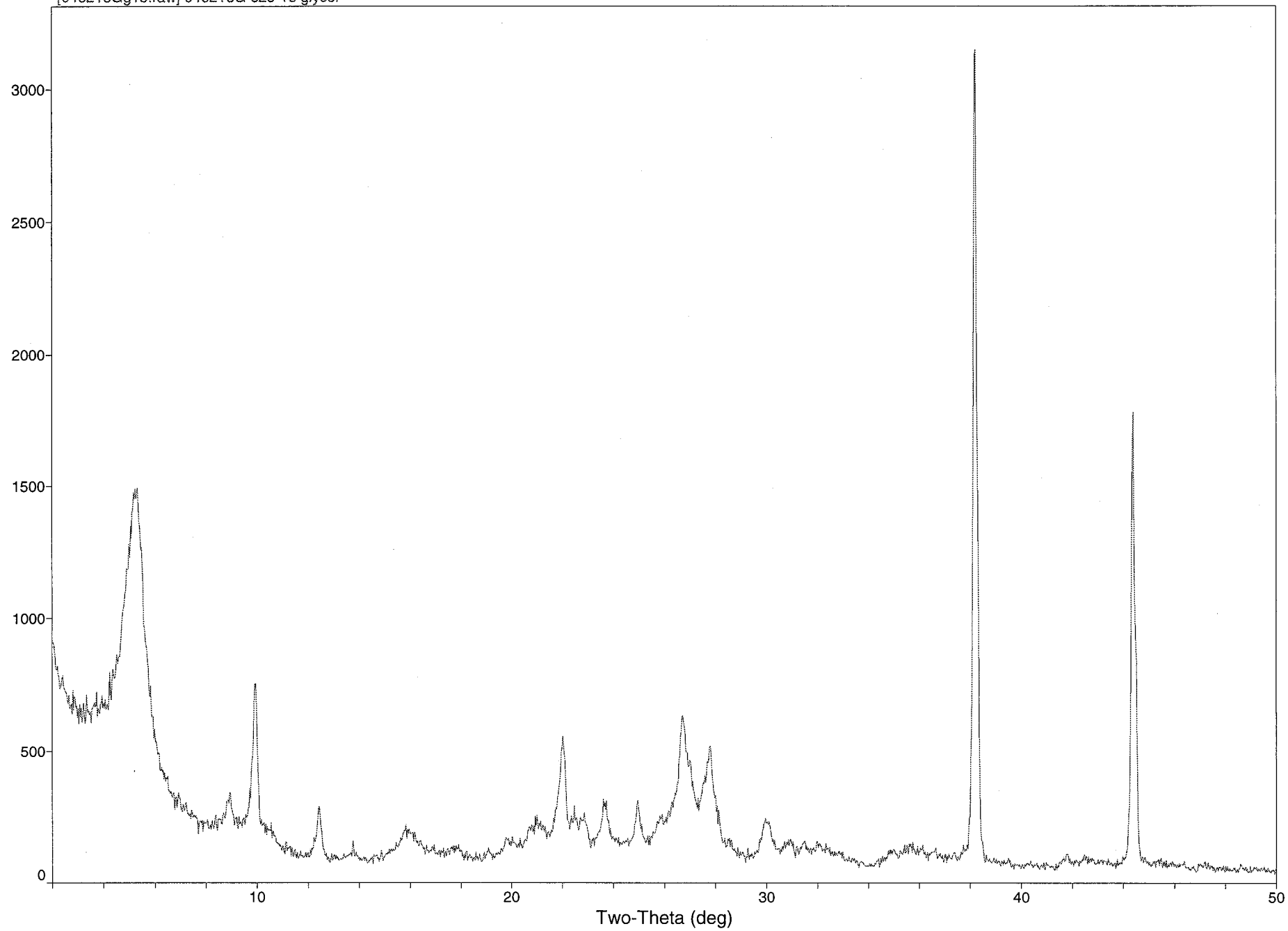
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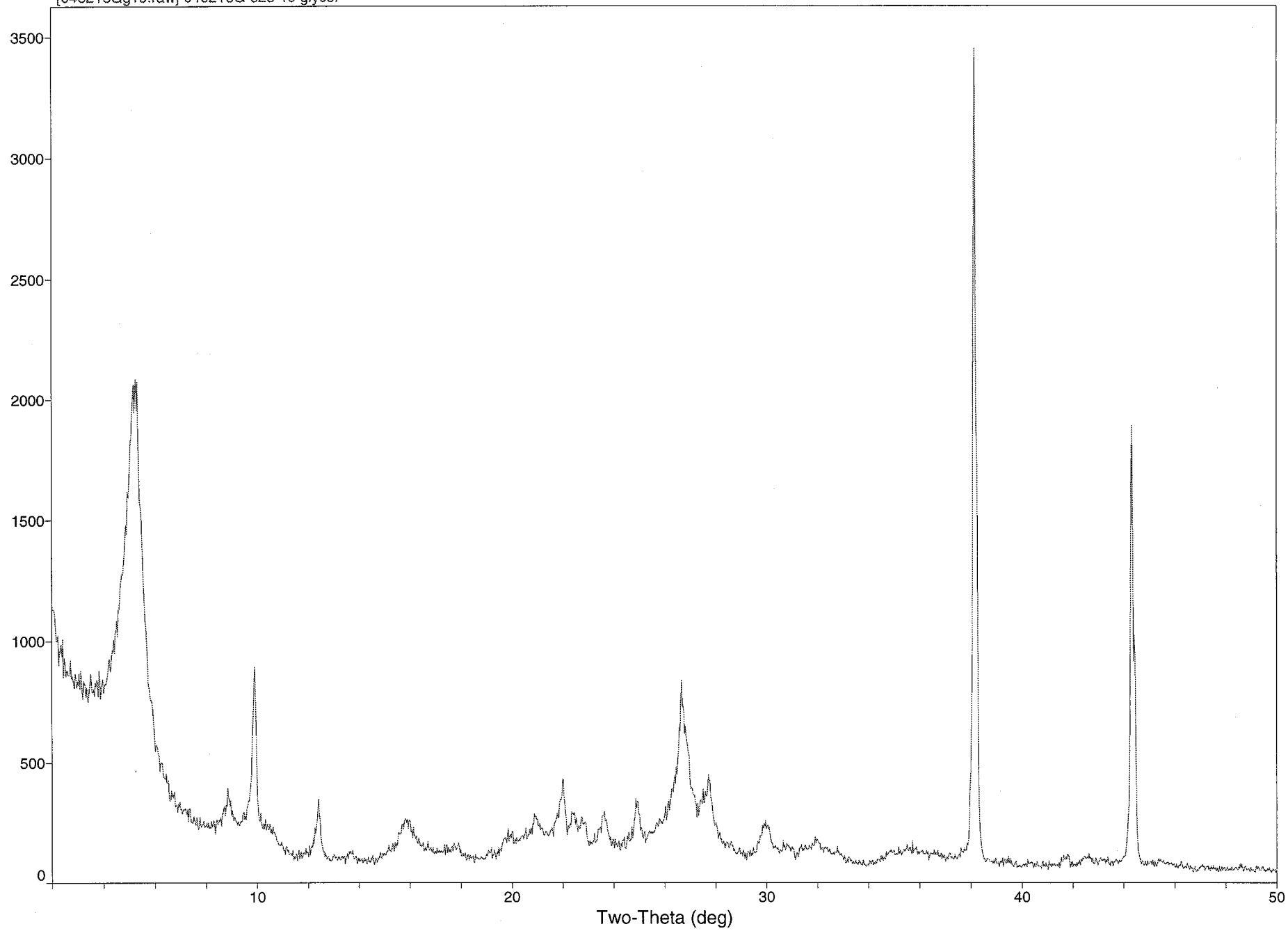
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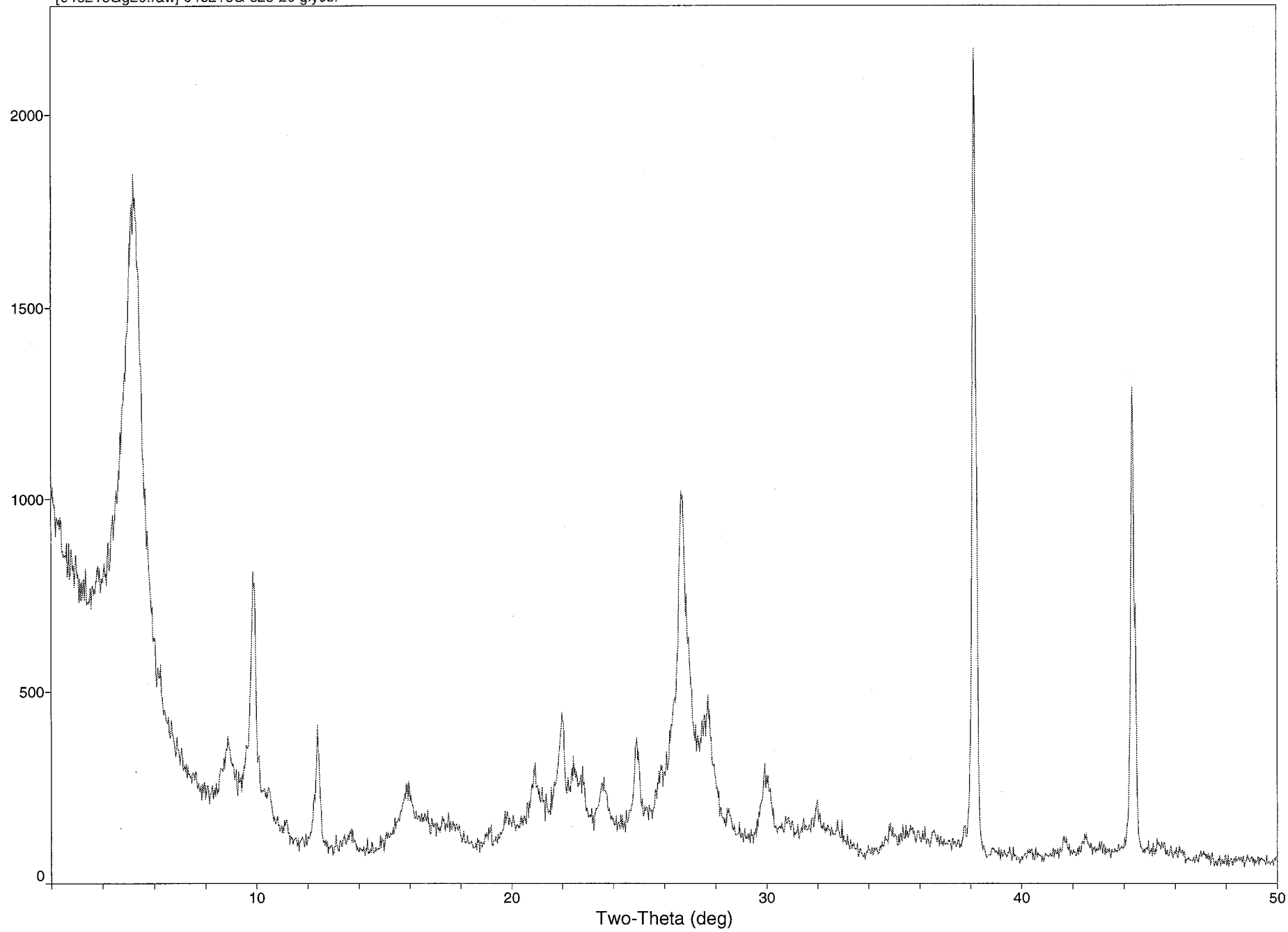
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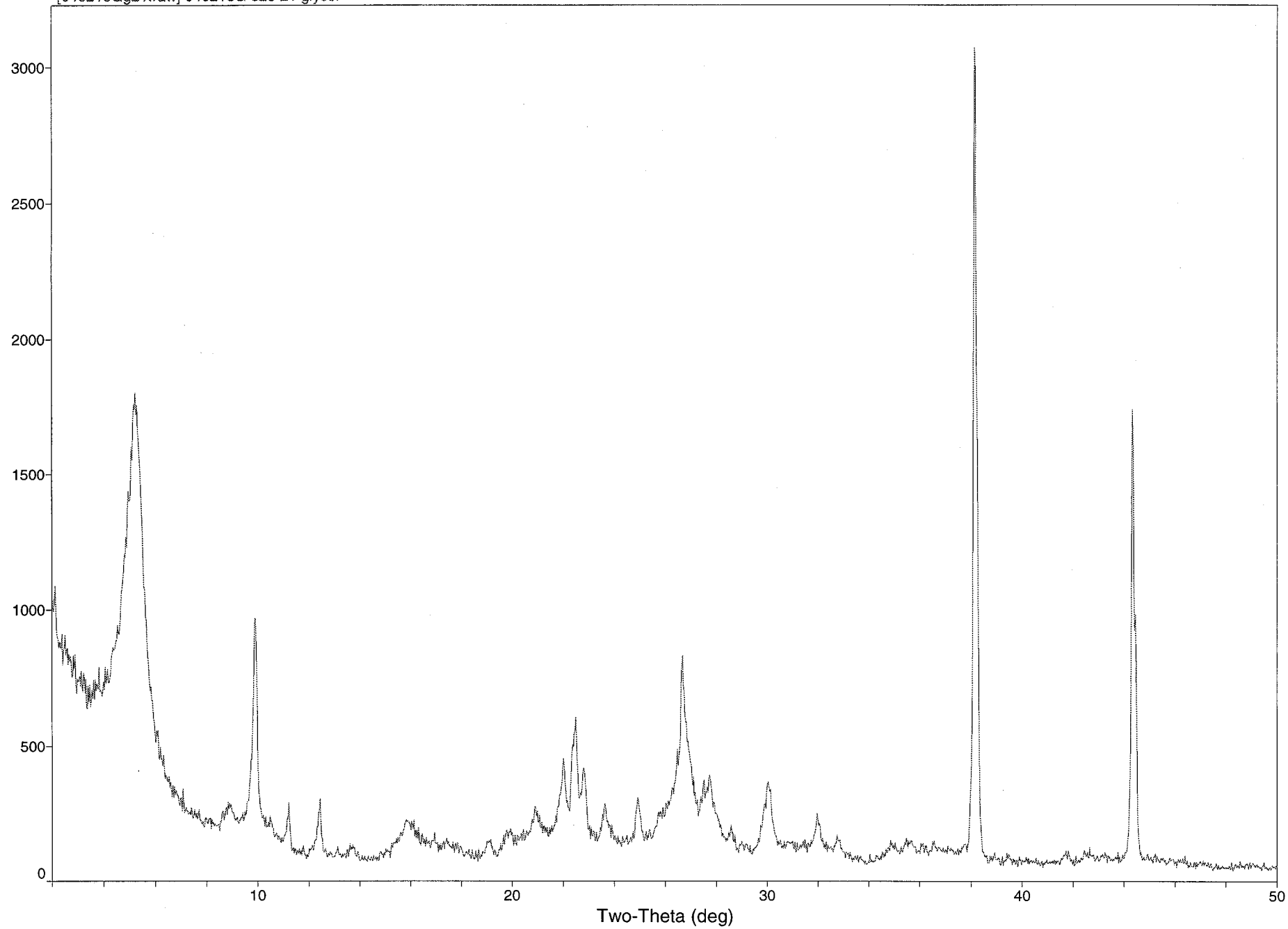
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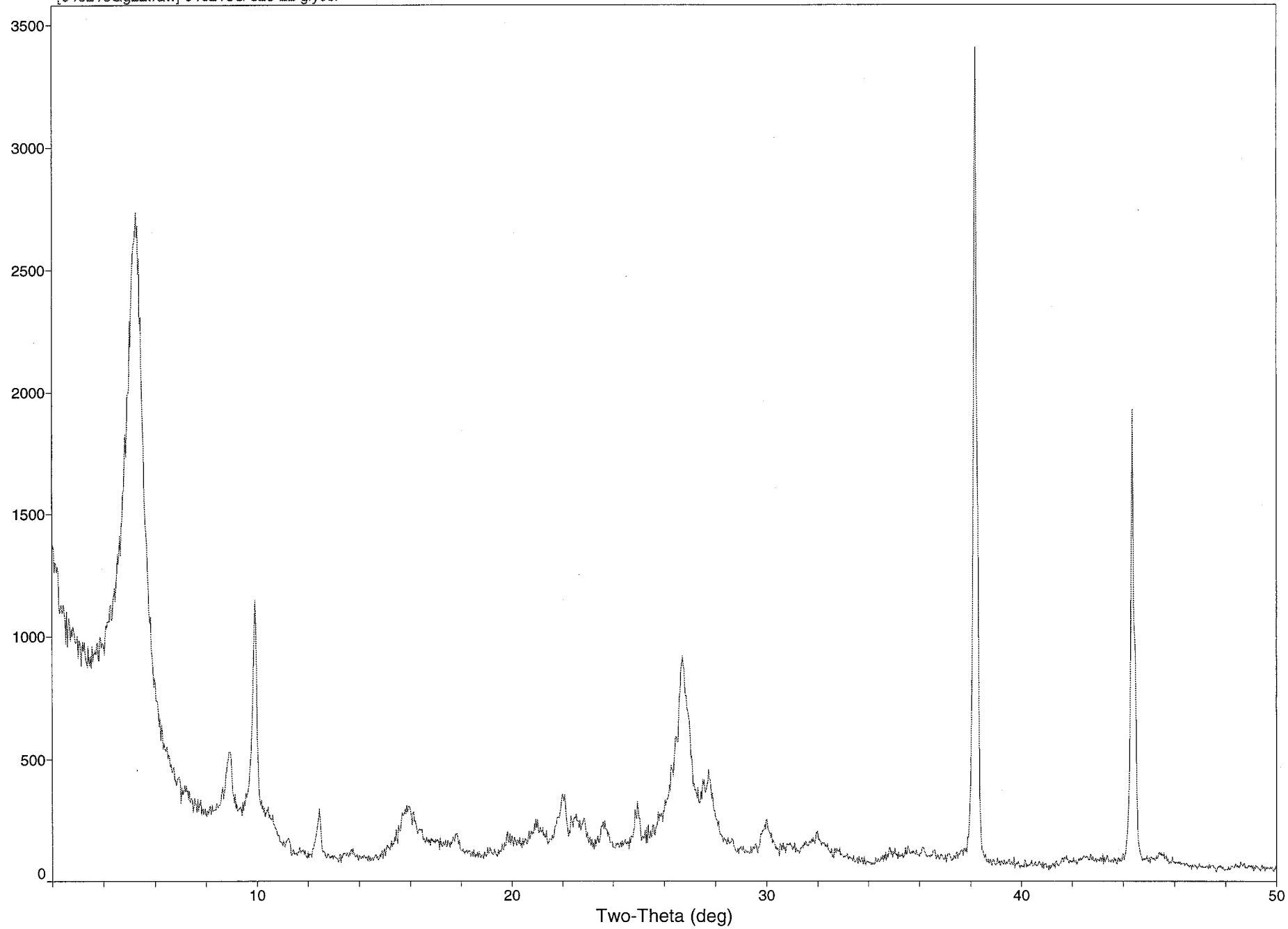
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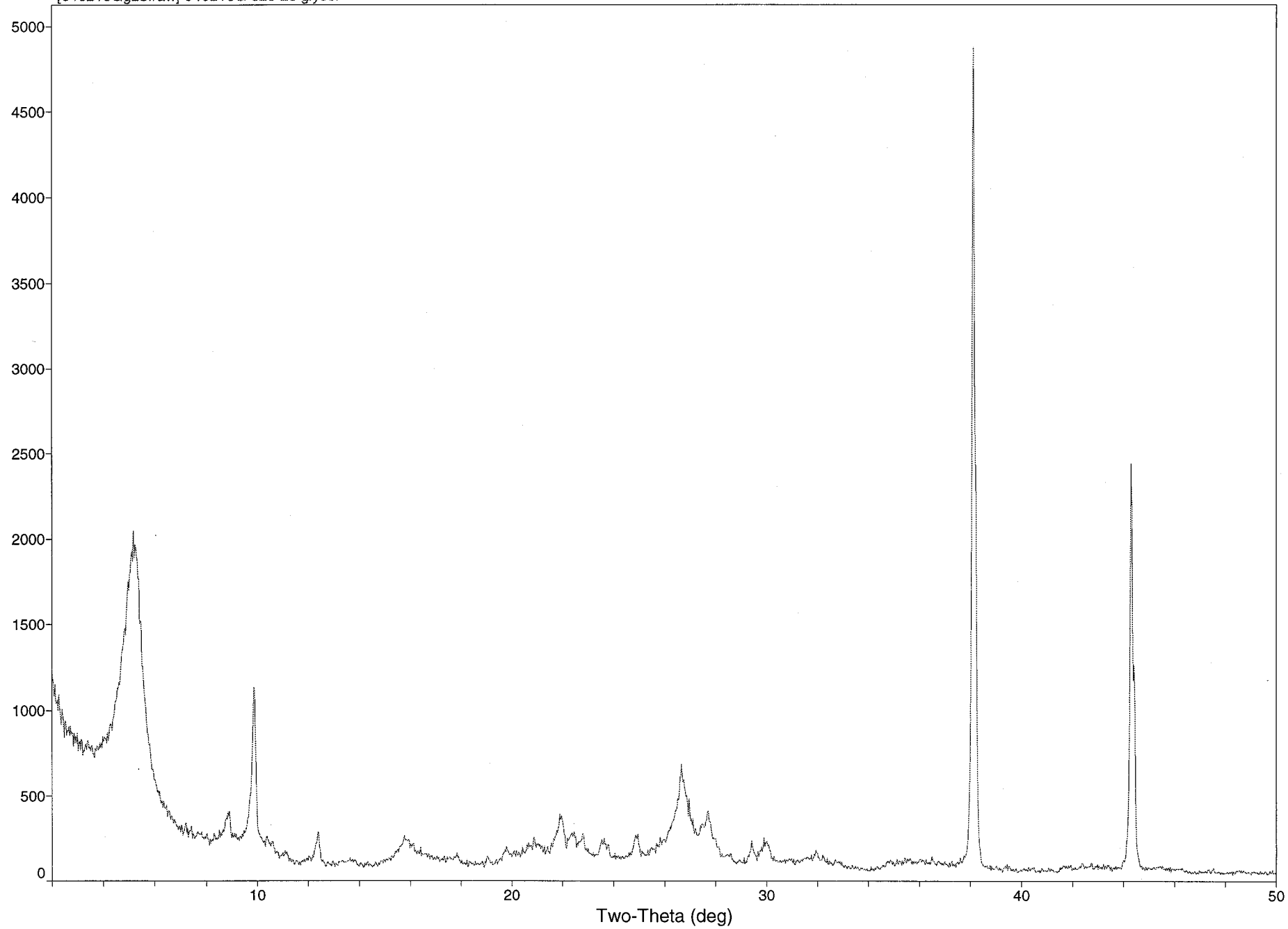
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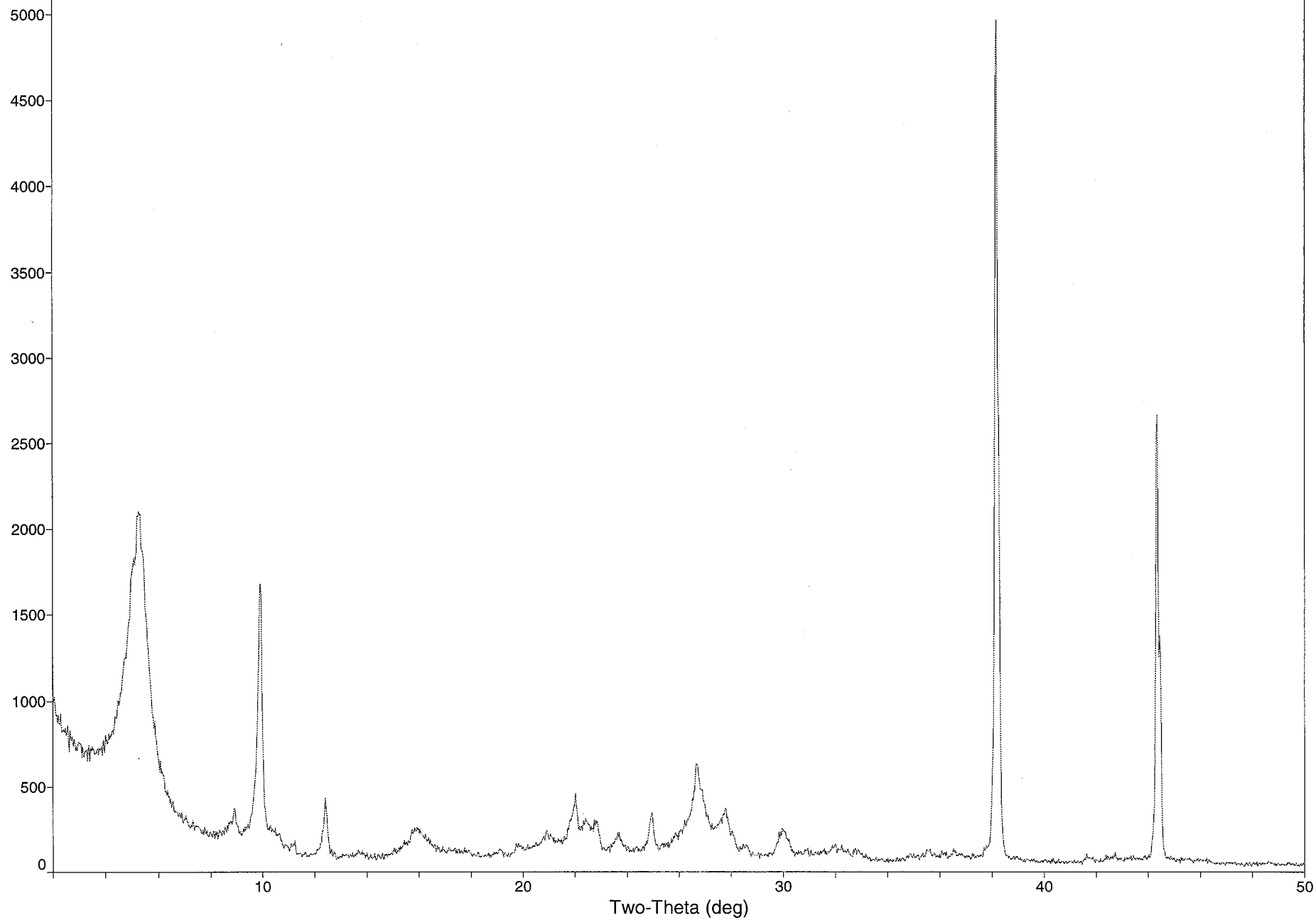
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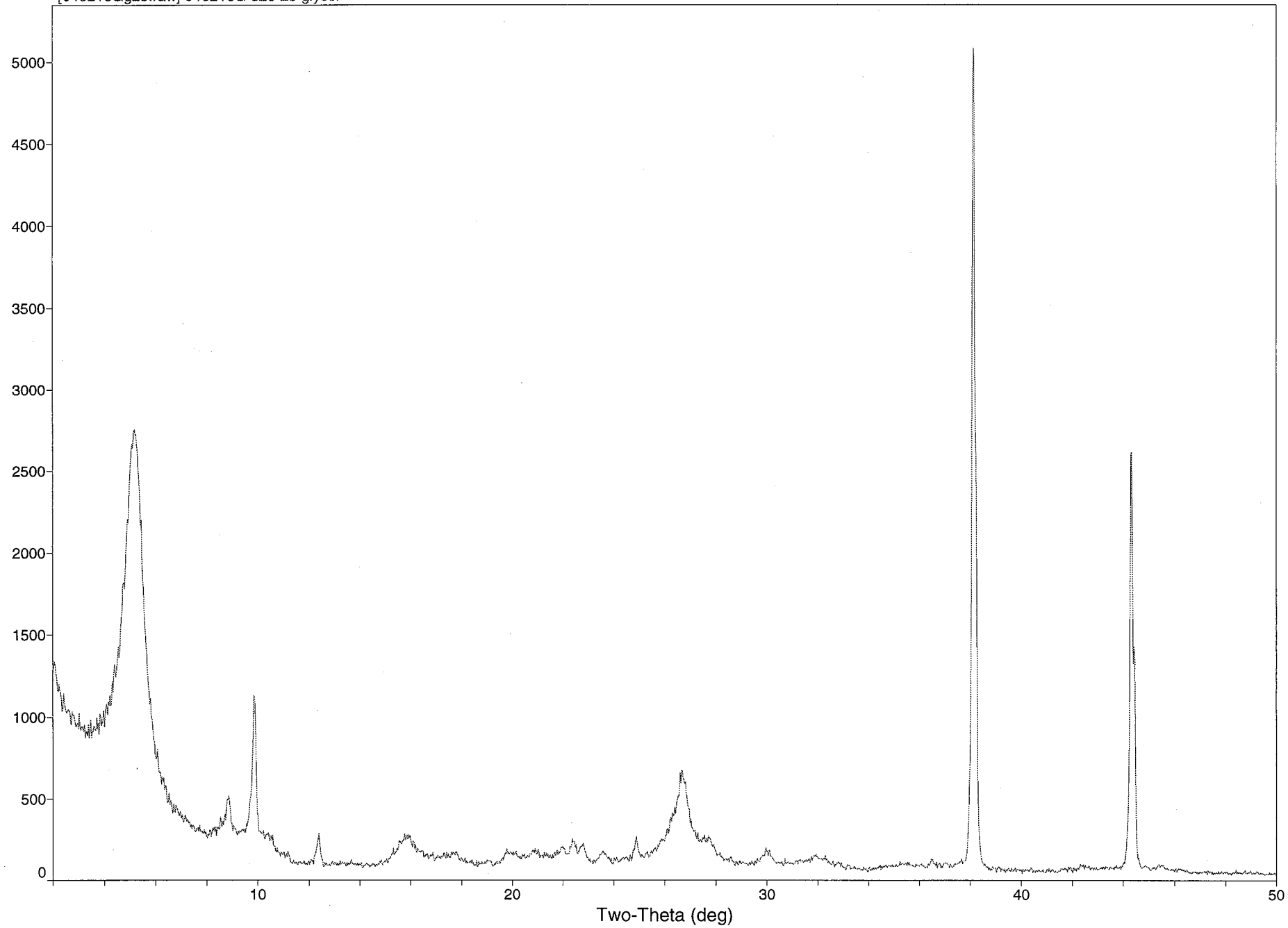
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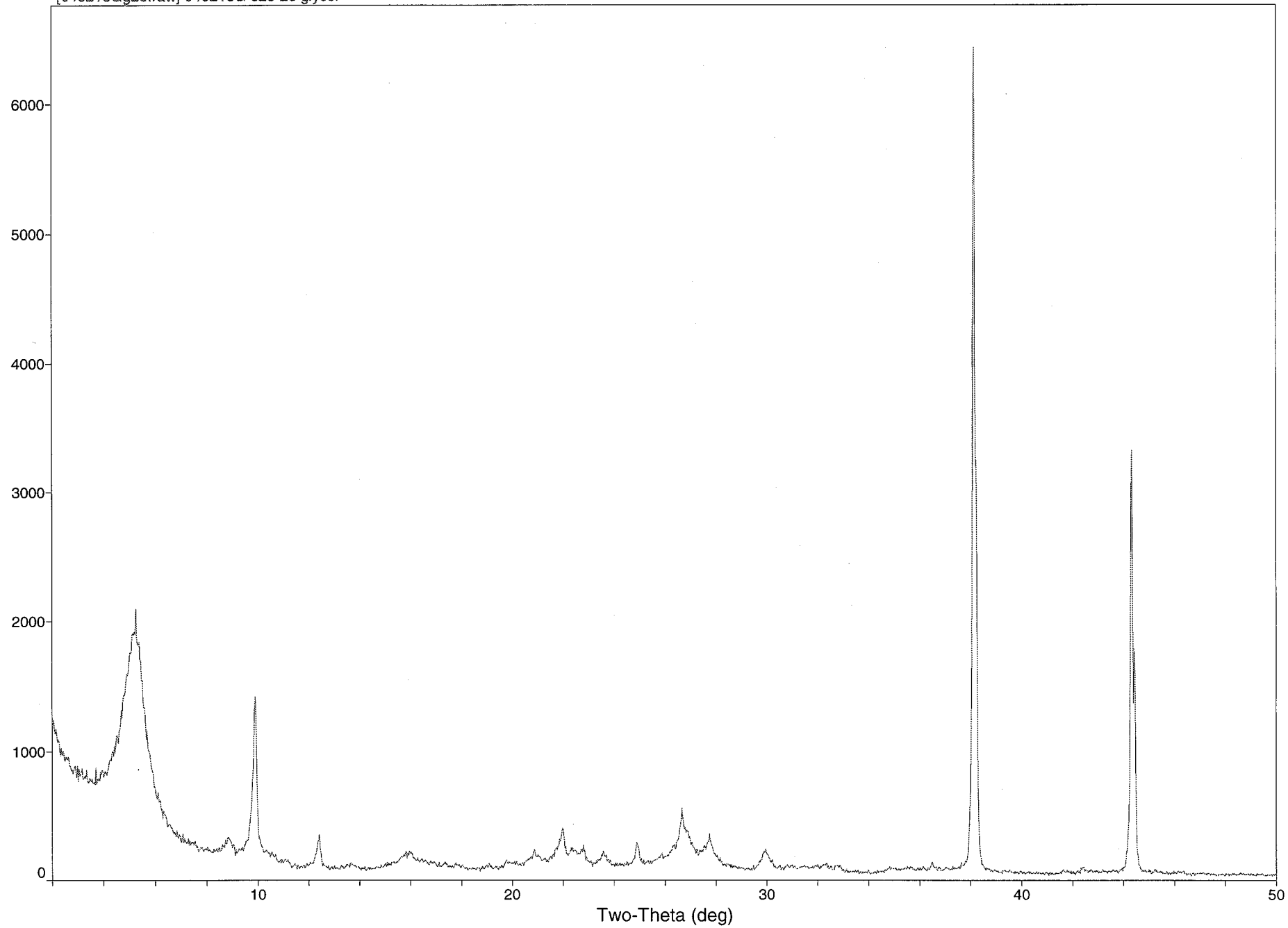
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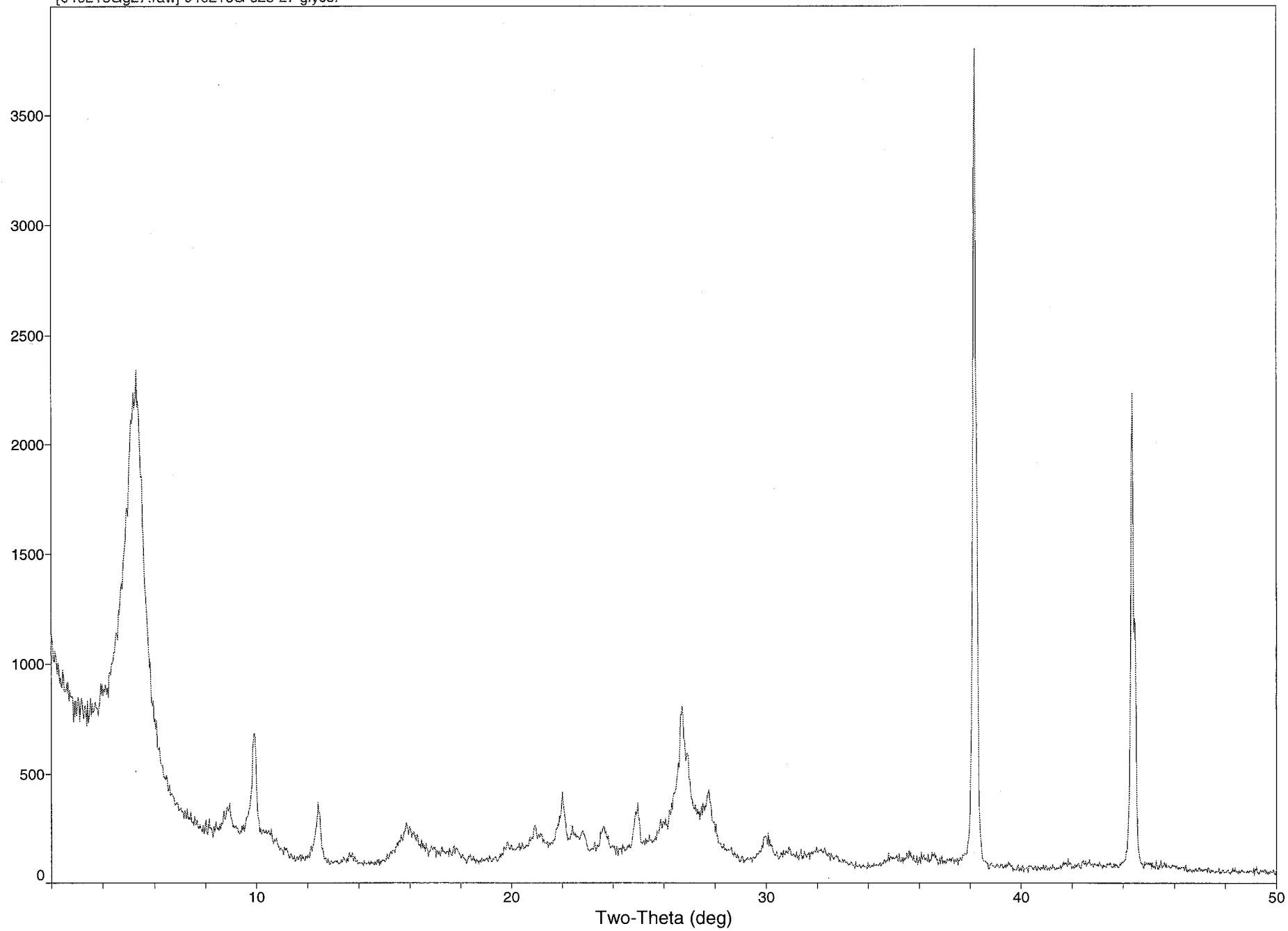
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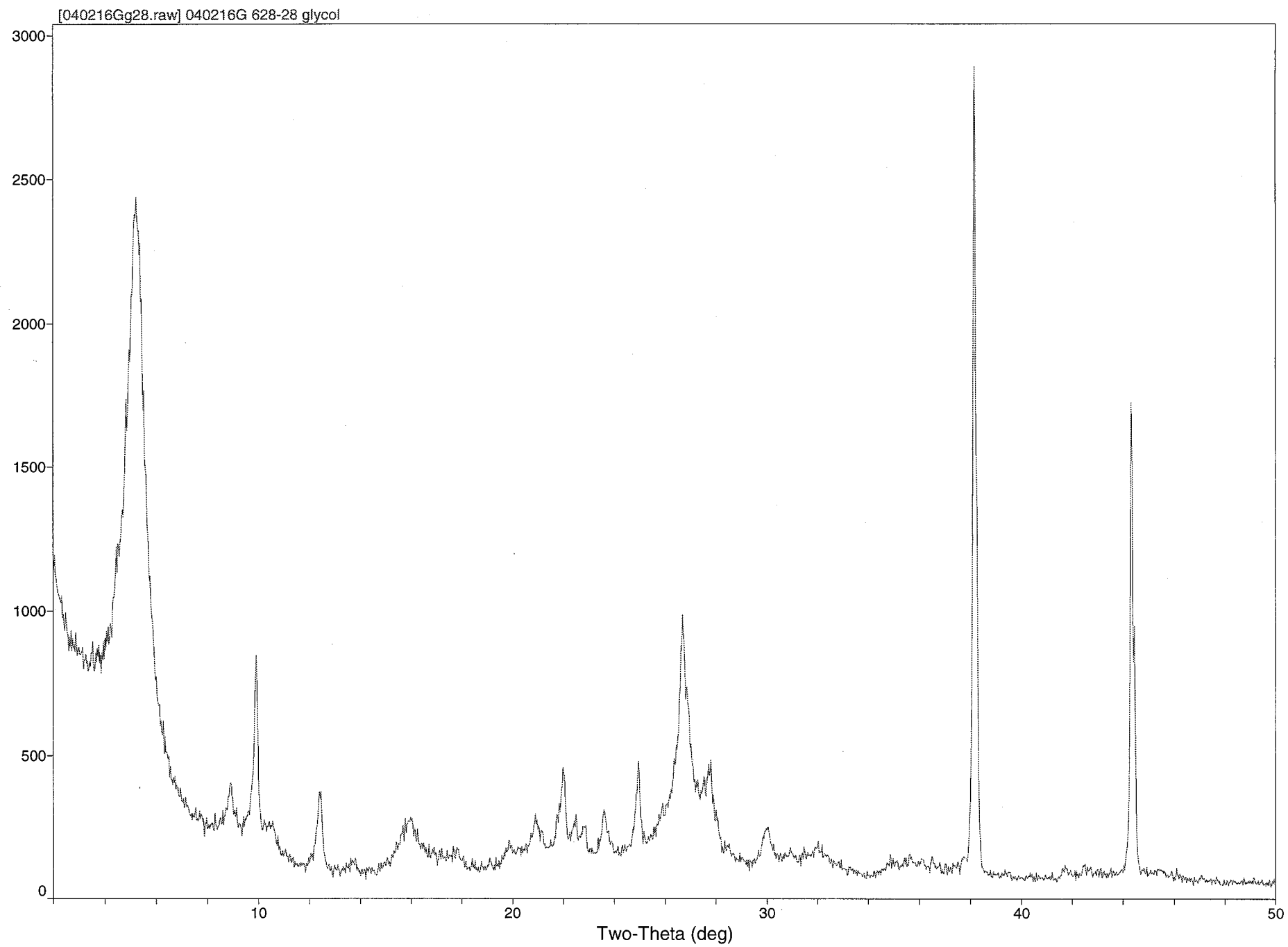


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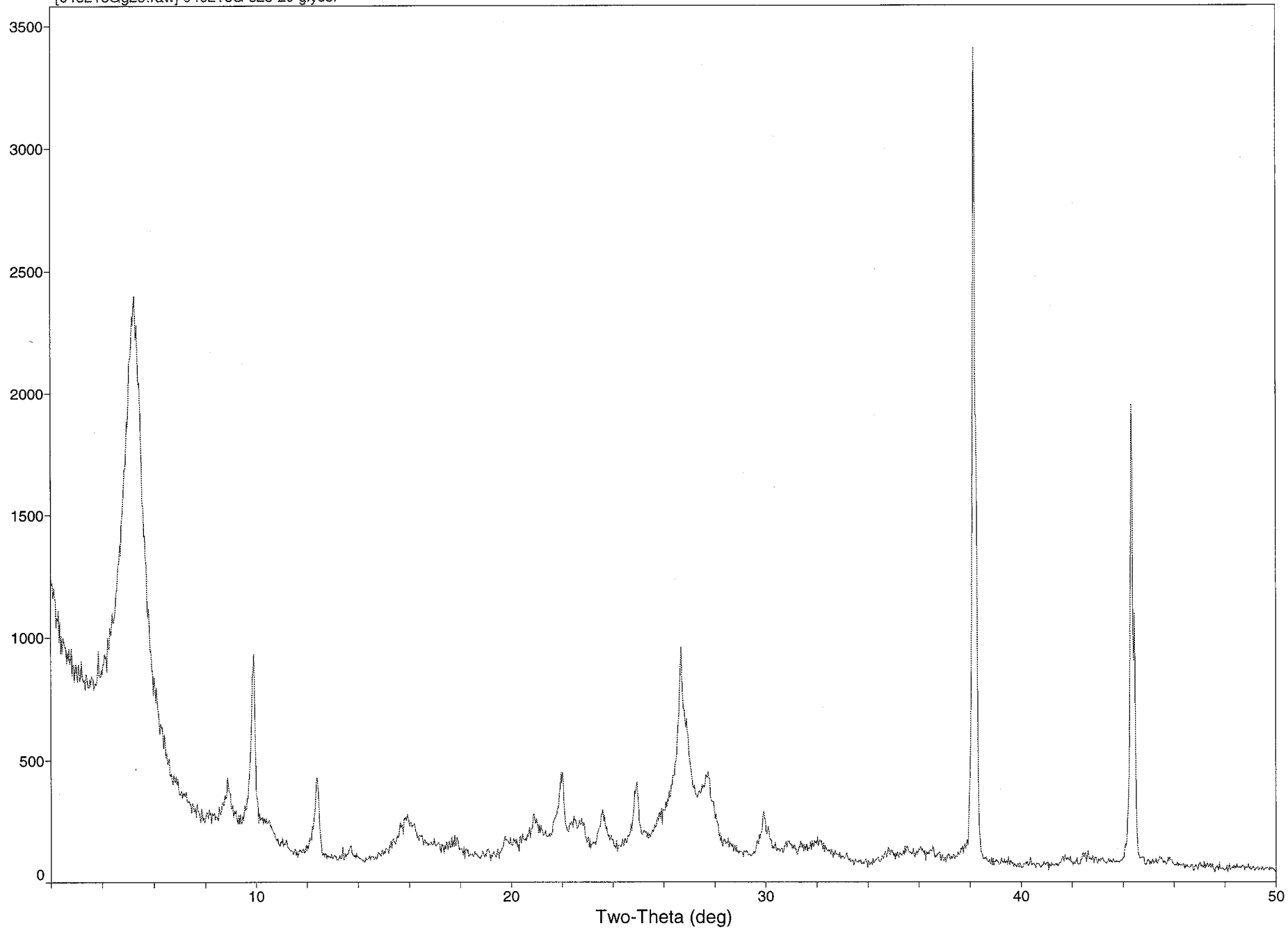


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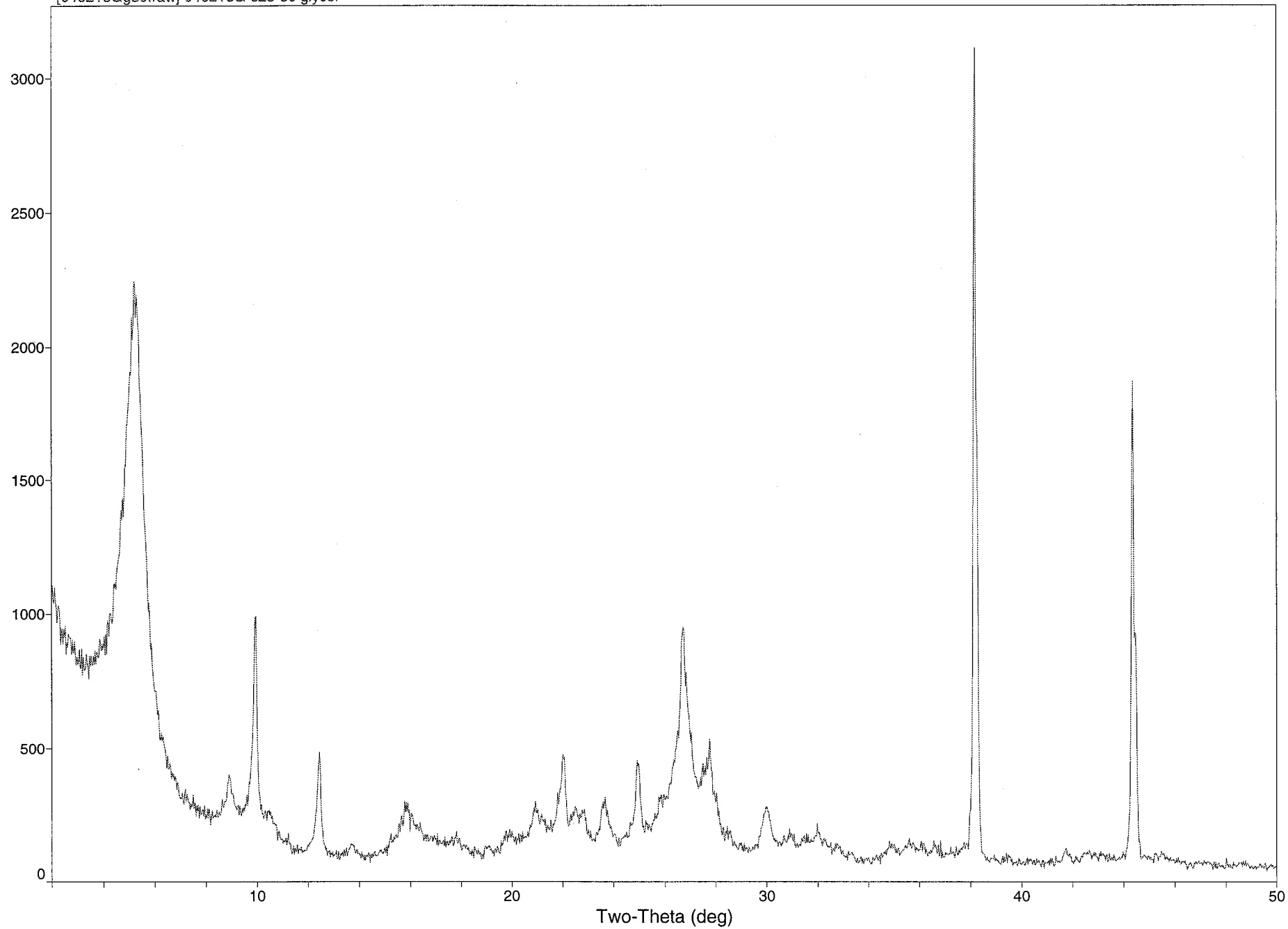




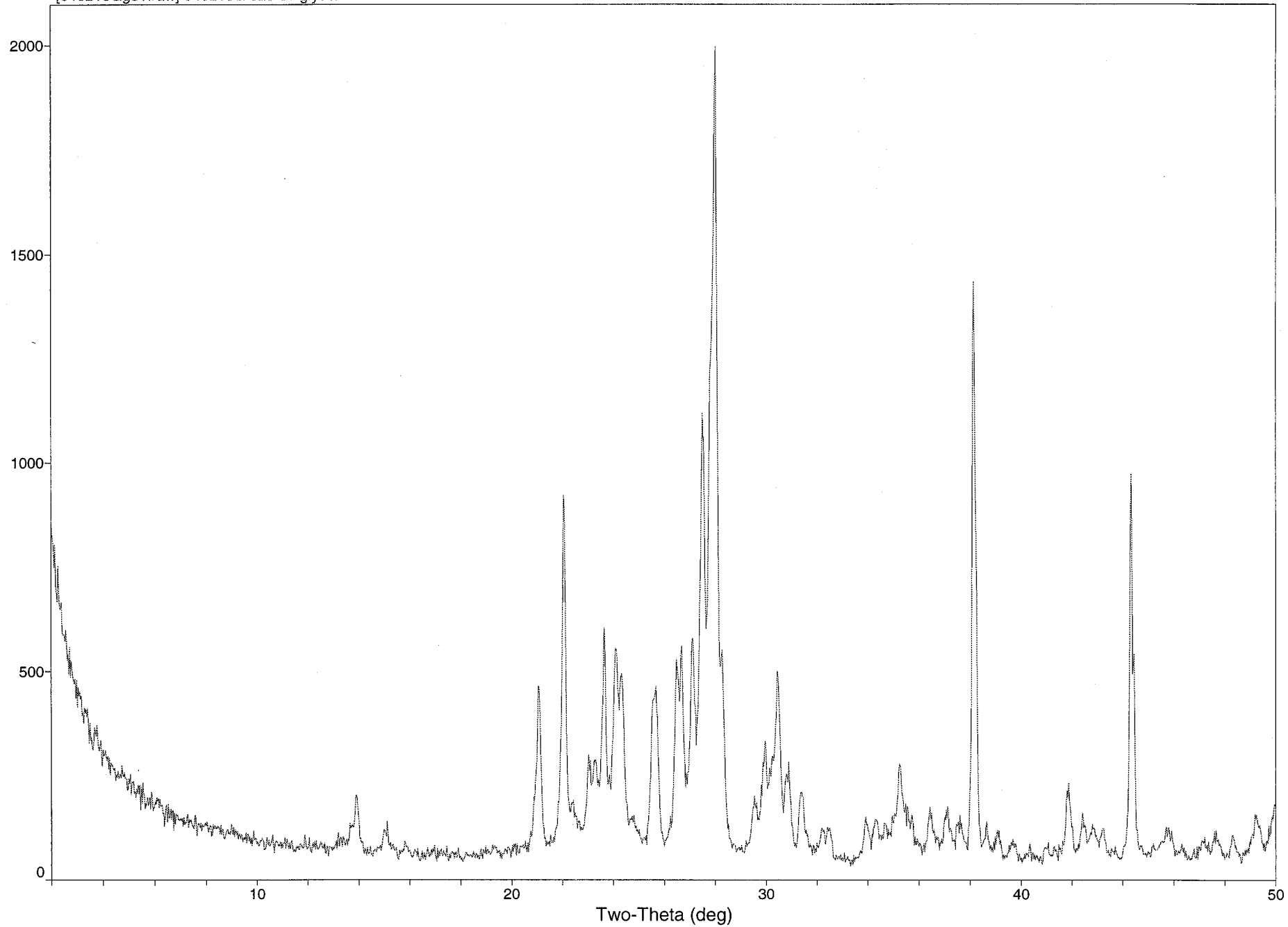
[040216Gg29.raw] 040216G 628-29 glycol

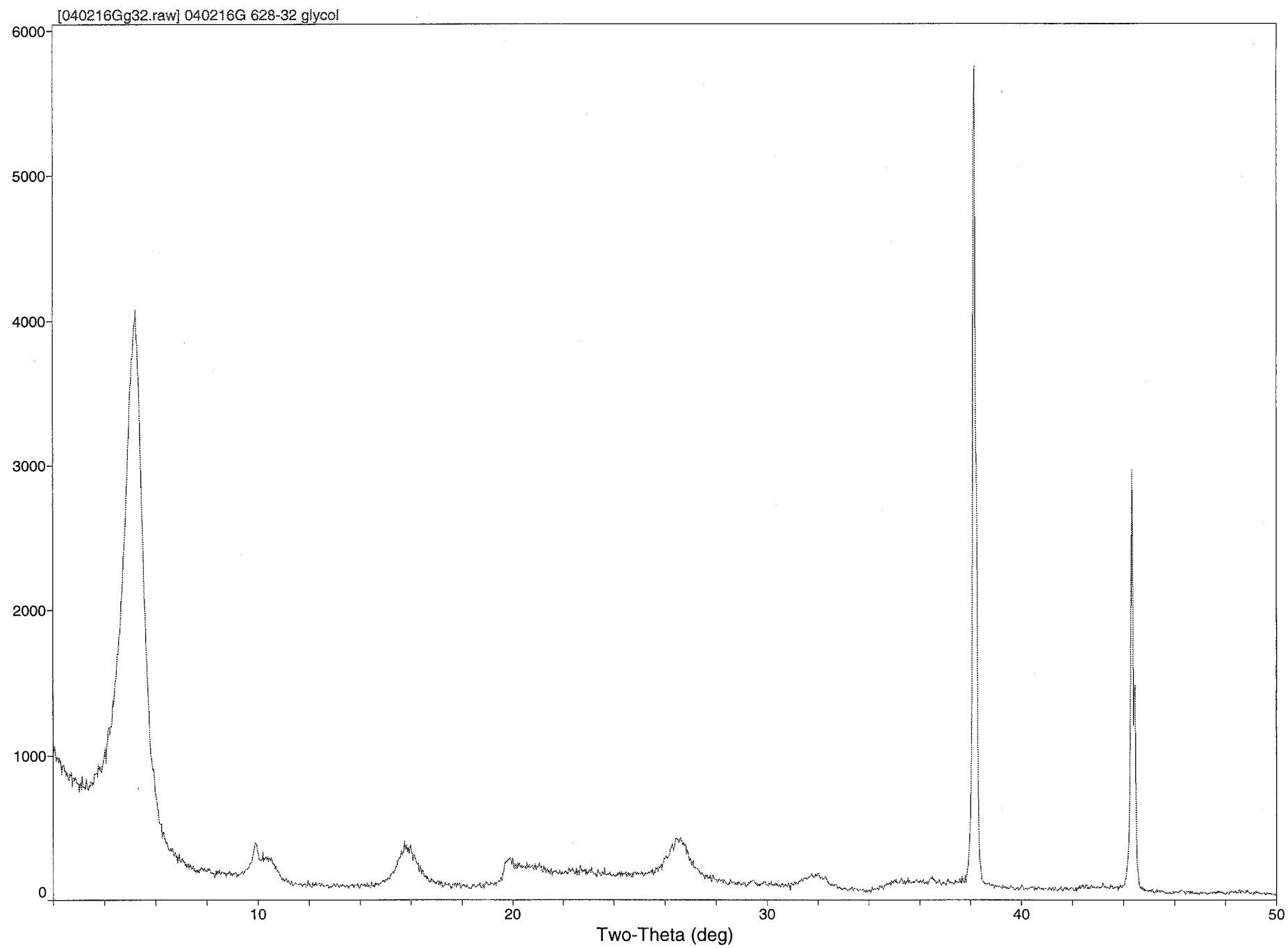


[040216Gg30.raw] 040216G 628-30 glycol



[040216Gg31.raw] 040216G 628-31 glycol





[040216Gg33.raw] 040216G 628-33 glycol

