

ERM-BD150 – Skimmed Milk Powder

SUMMARY

The application note summarizes the digestion of ERM-BD150, a skimmed milk powder Certified Reference Material using ColdBlock™ Digestion Pro Series Technology.

Instrument: ColdBlock CBM sample digester, chiller, Quartz Vessels , ICP-MS

Published: March 2023

Digestion Time: 20 Minutes

Acid Used: HNO₃ & H₂O₂

Average ColdBlock Recovery vs. CRM:

- 102% Cadmium
- 104% Mercury
- 98% Selenium

METHODOLOGY

1. Chiller temperature was set to -5°C
2. 0.5g of each sample was weighed and placed into a quartz ColdBlock™ Digestion vessel
3. 15mL of Nitric acid was added
4. Sample was digested at 70% power for 15 minutes
5. 2mL of 30% _{v/v} Hydrogen Peroxide was added
6. Samples were digested again at 70% power for 5 minutes
7. Samples were cooled and bulked to 40mL using 2% HNO₃ + 0.5% HCl _{v/v}

DISCUSSION

- The samples were clear at the end of the digestion
- Samples were analyzed by ICP-MS



Figure 1 ERM-BD150 after bulk up

ERM-BD150; Skimmed Milk Powder; European Commission, Joint Research Centre, Directorate F – Health, Consumers and Reference Materials Retieseweg 111 B-2440 Geel, Belgium

ERM-BD150 – Skimmed Milk Powder

Results

ERM BD-150 – Skimmed Milk Powder											
Method:	0.25g	15mL HNO ₃ -Digest at 70% power for 15 minutes, add 2mL H ₂ O ₂ and digest again at 70% power for 5 minutes									
Element	Certified Value (ppm)	+/-	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery
			Low	High							
Ca	13900	800	13100	14700	13522	13349	13656	13509	126	0.9%	97%
K	17000	700	16300	17700	17285	17372	17703	17453	180	1.0%	103%
Mg	1260	100	1160	1360	1231	1230	1244	1235	7	0.5%	98%
Na	4180	190	3990	4370	4104	4092	4164	4120	31	0.8%	99%
P	11000	600	10400	11600	11433	11593	11007	11344	247	2.2%	103%
Cd	0.0114	0.0029	0.0085	0.0143	0.0116	0.0118	0.0116	0.0117	0.0001	0.8%	102%
Cu	1.08	0.06	1.02	1.14	1.11	1.07	1.05	1.07	0.02	1.9%	99%
Fe	4.6	0.5	4.1	5.1	4.6	4.4	4.6	4.5	0.1	2.1%	98%
Hg	0.06	0.007	0.053	0.067	0.07	0.06	0.06	0.063	0.003	4.6%	104%
Mn	0.289	0.018	0.271	0.307	0.265	0.334	0.284	0.294	0.03	9.9%	102%
Pb	0.019	0.004	0.015	0.023	0.027	0.024	0.021	0.024	0.002	10.2%	126%
Se	0.188	0.014	0.174	0.202	0.207	0.172	0.173	0.184	0.016	8.8%	98%
Zn	44.8	2	42.8	46.8	46.4	44.7	46.8	46.0	0.9	2.0%	103%