

Supplementary material to

# Kinetic behaviour of the roasting/selective reduction process with the use of a mixture of bituminous coal and fuel oil as the additive

Hugo Javier Angulo-Palma<sup>1,2</sup>, Manuel Saldana<sup>3,4</sup>, Ángel Legrá Legrá<sup>1</sup>, Alisa Lamorú Urgellés<sup>1</sup>, Carlos Hernández Pedrera<sup>5</sup>, Sandra Gallegos<sup>3</sup>, Felipe M. Galleguillos Madrid<sup>6</sup> and Norman Toro<sup>3</sup>

<sup>1</sup>Centro de Investigaciones del Níquel “Alberto Fernández Montes de Oca” (CEDINIQ), Moa, Holguín, Cuba

<sup>2</sup>Departamento de Metalurgia Química, Universidad de Moa, Holguín, Cuba

<sup>3</sup>Faculty of Engineering and Architecture, Universidad Arturo Prat, Iquique, Chile

<sup>4</sup>Departamento de Ingeniería Química y Procesos de Minerales, Universidad de Antofagasta, Antofagasta, Chile

<sup>5</sup>Facultad de Ingeniería Química y Agronomía, Universidad de Oriente, Santiago de Cuba, Cuba

<sup>6</sup>Centro de Desarrollo Energético Antofagasta, Universidad de Antofagasta, Antofagasta, Chile

*Hem. Ind.* **79(2)** 69-77 (2025); <https://doi.org/10.2298/HEMIND240918005A>

**Table S1.** Kinetics of the NiO reduction process at the high thermal profile

Time, min	NiO content, wt. %			Average
	1	2	3	
0	1.056	1.067	1.078	1.067
10	1.022	1.030	1.050	1.034
20	0.983	0.980	1.010	0.991
30	0.581	0.616	0.633	0.610
40	0.430	0.460	0.479	0.456
50	0.409	0.380	0.420	0.403
60	0.320	0.350	0.380	0.350
70	0.300	0.310	0.347	0.319
80	0.281	0.259	0.276	0.272

**Table S2.** Kinetics of the NiO reduction process at the low thermal profile

Time, min	NiO content, wt. %			Average
	1	2	3	
0	1.051	1.045	1.022	1.039
10	1.020	1.021	1.008	1.016
20	1.007	0.983	0.979	0.990
30	0.698	0.757	0.751	0.735
40	0.571	0.548	0.572	0.564
50	0.429	0.456	0.428	0.438
60	0.399	0.360	0.391	0.383
70	1.051	1.045	1.022	1.039
80	1.020	1.021	1.008	1.016



