









SELF-BURNING COAL MINING RESIDUES - AN ENVIRONMENTAL ISSUE OR A SOURCE OF RAW MATERIALS ?

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Characterization of coal mining waste materials and identification of products formed during self-burning reveal:

→ The potential environmental impacts (emission of volatile compounds; percolation and mobilization of contaminants to surrounding soils and water systems)

→ The enrichment of some trace elements (including critical raw material)

→The production of carbon materials (graphitic structures, graphene, carbon nanotubes)

Coal mining waste materials are a promising alternative as a secondary source of critical raw materials.

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DOURO COALFIELD

NW OF PORTUGAL









At least 20 coal mining waste deposits can be found in Douro Coalfield area. 6 of those are or were under self-burning process.

Concentration Coefficients (CC)	ELEMENTS CONCENTRATION IN SAMPLES	CC > 100 10 < CC < 100	Unusually enriched Significantly enriched Enriched Slightly enriched Normal Depleted
	ELEMENTS CONCENTRATION IN REFERENCE MATERIALS WCC - WORLD COALS COMPOSITION BBS - BACKGROUND OF BLACKSHALES	5 < CC < 10 E 2 < CC < 5 S 0.5 < CC < 2 N CC < 0.5 [



Concentration coefficients of trace elements in coal mining residues from Douro Coalfield relatively to WCC (world coals composition) and to BBS (background of blackshales) and of coal from Douro Coalfield relatively to WCC.

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Graphene sheets and carbon nanotubes produced during self-burning of coal waste materials in Douro Coalfield (Ribeiro et al., 2010, 2017)

Ribeiro, J., Flores, D., Ward, C., Silva, L.F.O., 2010. Identification of nanominerals and nanoparticles in burning coal waste piles from Portugal. Science of the Total Environment 408, 6032-6041. Ribeiro, J., Piella, J., Puntes, V., Suárez-Ruiz, I., Flores, D., 2017. Identification and characterization of C-nanoparticles and nanominerals from coal combustion by HR-TEM/EDX. II Jornadas de Caracterização de Materiais.

THANK YOU FOR YOUR ATTENTION

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