



STRUCTURAL CHARACTERIZATION AND IN VITRO CYTOTOXIC POTENTIAL OF COAL DUST IN A ROMANIAN POWER PLANT

Alice Raducanu^{1*}, Aurica Suvergel¹, George Darie², Ileana Rau², Constantin Grigoriu³, Cristian Viespe³, Traian Vasiiu⁵, Ionela Daniela Popescu⁴, Eleonora Codorean⁴

¹Institute for Energy Research and Development, 8 Energeticienilor Blvd., District 3, 032092 Bucharest, Romania

²Politehnica University from Bucharest, 1 Polizu Street, 011061 Bucharest, Romania

³National Institute for Laser, Plasma and Radiation Physics, 409 Atomistilor Street, 077125 Bucharest-Magurele, Romania

⁴“Victor Babes” National Institute of Pathology, 99-101 Splaiul Independentei, 050096 Bucharest, Romania

⁵SC Electrocentrale DEVA SA, 1 Santierului Street, Mintia, Hunedoara, Romania

Abstract

A number of specific measures have been undertaken in Romania in the power generation sector in order to limit or eliminate the pollutants and to prevent their adverse health effects of occupational exposure. However these measures did not result to the expected efficiency, and a number of work places still exist within the thermal power plants where the employees work under improper conditions. The infliction of the working environment, dust and ash fine particles from coal-fired power plants has a detrimental effect upon the exposed subjects depending on the pollutants toxicity, the concentration, exposure duration, and health state of the subjects exposed.

The paper presents a quantitative and qualitative assessment of dust, with estimation of chemical-structural composition and particle size distribution within Deva-Romania power plant. The cytotoxic potential *in vitro* on BALB/c 3T3 fibroblast cell line is also presented as a measure of the biological reactivity of hazardous compounds existent in coal dust and ash samples from the investigated site. The preliminary *in vitro* results indicate that even at small doses of the dust and ash samples the cytotoxic effects were detectable by inhibiting cell proliferation and increasing LDH release and following a dose-effect behavior.

Key words: ash, coal dust, coal power plant, crystalline silica, in vitro cytotoxicity, size distribution

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* Author to whom all correspondence should be addressed: e-mail: alice.raducanu@yahoo.com; Phone: +40-212700469; Fax:+40-213035903