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POTENTIAL USES OF GEOPOLYMERS TO IMMOBILIZE TOXIC METALS FROM BY-PRODUCTS MATERIALS

Lukáš Kalina*, Jan Koplík, František Šoukal, Jiří Másilko, Lenka Jaskowiecová

*Brno University of Technology, Faculty of Chemistry, Centre for Materials Research CZ.1.05/2.1.00/01.0012,
Purkyňova 464/118, Brno, CZ-61200, Czech Republic*

Abstract

Portland cement-based products are the most commonly used building materials. Worldwide production accounted for about 2.5 billion metric tons. However, it is well known that the production of Ordinary Portland Cement (OPC) is associated with generating of by-product materials. Cement kiln dust is one of secondary material of cement manufacturing process. Purpose of this work is to use this undesirable material for development of new cementitious material similar to Portland cement-based concrete, which is convenient in terms of energy and is environmental-friendly at once. This article presents preparation and composition of new alkali activated material, called geopolymer, synthesized from blast furnace slag and fly ash activated by sodium hydroxide and cement kiln dust as well as the potential to immobilize heavy metals in its structure. Study was mainly based on SEM-EDX, XRD and ICP-MS analyses.

Key words: alkali activation, cement kiln dust, environmental-friendly material, immobilization

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* Author to whom all correspondence should be addressed: e-mail: kalina@fch.vutbr.cz