

Upcycling of Inorganic Waste: Lessons Learned and Outlook for the Future

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Abstract : Inorganic waste upcycling offers a solution how to avoid landfilling and how to save raw materials at the same time. However, its practical implementations in Slovakia and elsewhere in Europe, are rather limited despite the potential smaller countries like Slovakia have their advantage in closely-knitted inorganic materials industry. One part of discussion should include an overview of wastes that can be possibly used for upcycling, i.e. fly ashes, red mud, glass cullets, vitrified bottom ashes etc. These wastes can be processed by a variety of strategies, the one of our choice, alkali activation, opens the possibility for the formation of novel materials at almost negligible energetic expense. In the research, these materials are characterized by comprehensive means (X-Ray Fluorescence, Diffraction methods, Thermal Analysis, Scanning Electron Microscopy, Mechanical tests and Chemical stability), which time and time again demonstrate their competitive properties against traditional materials available at the market. It is just a question for discussion why these materials do not receive more significant attention from industry and there is pressing interest for the solution of standing situation.

Keywords : upcycling, inorganic wastes, glass ceramics, alkali-activation

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