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NOVEL WASTE-CONTAINING GEOPOLYMERS FOR ENVIRONMENTAL APPLICATIONS

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The exhaustion of raw materials, the unprecedented volume of produced wastes and the stunning energy consumption levels are probably the three main concerns affecting our society. For that reason the development of new materials with improved performance and low carbon footprint is a critical and pressing matter. Geopolymers emerge as an excellent solution to conventional materials in applications ranging from thermal insulation, pH buffer, water purification, filtration and metal adsorption. Moreover distinct waste streams (e.g. fly ash, waste glass, red mud) can be used as precursors in geopolymers production, which reduces the consumption of virgin raw materials while mitigating the wastes environmental impact. In this talk the possibility of using unexplored biomass fly ash as a partial replacement of benchmark metakaolin will be considered. The development of lightweight geopolymers for innovative applications, such as pH buffer and heavy metal adsorbent, will be addressed.