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Synthesis of new materials based on metallurgical slags as a contribution to the circular economy(Article)

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Abstract: This work is aimed at developing knowledge about the possibilities of a circular economy arising from the processing of metallurgical slag, which in a number of indicators is close to natural formations. The possibility of manufacturing ceramic catalyst carriers from natural raw materials and industrial waste (metallurgical slags) using powder metallurgy is considered. Properties of metallurgical slags are studied by X-ray diffraction analysis, methods of simultaneous thermal analysis (thermogravimetry/differential thermal analysis), optical microscopy and scanning electron microscopy. Studies have revealed the similarity of the structure and properties of natural raw materials and studied metallurgical slag. It was established that the studied metallurgical slags could be used as an additional component to the zeolite–bentonite base to create a ceramic carrier for the catalyst. Graphic abstract: The scheme of manufacture of catalyst carriers from natural raw materials and metallurgical slag.[Figure not available: see fulltext.]. © 2019, Springer-Verlag GmbH Germany, part of Springer Nature.