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Ceramic pigments of the garnet type synthesized by utilization of rice husk ash

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Abstract: The main task of the present work was to synthesize ceramic pigments of the garnet type by utilizing a widespread bio-waste - rice husk. White ash from oxidized at 6500C rice husk was used as a source of SiO2. The synthesis of pigments was carried out by a solid state reaction using the following initial materials: CaO, Cr2O3, Fe2O3 and V2O3. Ceramic pigments were synthesized at 1000°C and 1200°C. The properties of the garnet pigments were characterized mainly by X-ray diffraction, hot stage microscopy, DTA, SEM. The color of the pigments is determined by using the Lovibond Tintometer RT 100 Color - CIELab color measurement. The optimal synthesis parameters were determined. It was established that the pigments synthesized could successfully be used in glazes for wall tiles.

Keywords: andradite garnet, uvarovite garnet, rice husk ash, chromophore ions, Hot stage microscopy, SEM.