

## Synthesis and Characterization of praseodymium zircon as Yellow Pigment

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There is an increasing research interest of yellow pigment for coloring ceramics that must show thermal and chemical stability at high temperature [1]. Throughout history various yellow ceramic pigments have been used: yellow of vanadium-zirconia, tin-vanadium yellow, cadmium yellows, lead antimoniate, etc. The praseodymium zircon ( $\text{Pr-ZrSiO}_4$ ) yellow ceramic pigment is believed to be a solid solution of  $\text{Pr}^{4+}$  with the zircon lattice, but studies are poor and scarce [2].

The aim of this work, is the synthesis of  $\text{Pr-ZrSiO}_4$  yellow pigment in the presence of NaF and NaCl by the method of mixing metal oxides and to investigate the nature of the pigment. The  $\text{Pr-ZrSiO}_4$  particles are characterized by XRD, SEM and XRF to analyze their structure and morphology. The results show that particles of  $\text{Pr-ZrSiO}_4$  was synthesized, has particle size about 60-1000 nm by olivine-baddeleyite structure.

**Keywords:**  $\text{Pr-ZrSiO}_4$ , Zircon lattice, Yellow Pigment

### References

- [1] F. Bondioli, F. Andreola, L. Barbieri, T. Manfredini, A. M. Ferrari, *Journal of the European Ceramic Society*, 2007, 27, 3483–3488.
- [2] J. A. Badenes, J. B. Vicent, M. Llusar, M. A. Tena, G. Monros, *Journal of Materials Science*, 2002, 37(7):1413-1420.