

Zinc Borate Synthesis Using Hydrozincite and Boric Acid with Ultrasonic Method

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Abstract : Zinc borate is an important inorganic hydrate borate material, which can be use as a flame retardant agent and corrosion resistance material. This compound can loss its structural water content at higher than 290°C. Due to thermal stability; Zinc Borate can be used as flame reterdant at high temperature process of plastic and gum. In this study, the ultrasonic reaction of zinc borates were studied using hydrozincite ($Zn_5(CO_3)_2 \cdot (OH)_6$) and boric acid (H_3BO_3) raw materials. Before the synthesis raw materials were characterized by X-Ray Diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FT-IR). Ultrasonic method is a new application on the zinc borate synthesis. The synthesis parameters were set to 90°C reaction temperature and 55 minutes of reaction time, with 1:1, 1:2, 1:3, 1:4 and 1:5 molar ratio of starting materials ($Zn_5(CO_3)_2 \cdot (OH)_6 : H_3BO_3$). After the zinc borate synthesis, the products analyzed by XRD and FT-IR. As a result, optimum molar ratio of 1:5 ($Zn_5(CO_3)_2 \cdot (OH)_6:H_3BO_3$) is determined for the synthesis of zinc borates with ultrasonic method.

Keywords : borate, ultrasonic method, zinc borate, zinc borate synthesis

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