

Synthesis and Characteristics of Mesoporous SBA-15 Influence by HMTA as an Internal pH Modifier

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ABSTRACT

SBA-15 mesoporous silica was directly synthesised under difference acidic conditions by a “pH modification method” using hexamethylenetetramine (HMTA) as an internal pH-modifier. The synthesised material has been characterised by XRD, Nitrogen adsorption–desorption, and TEM. The characterisation results showed that mesoporous silica lead to high-ordered hexagonal mesoporous morphology by TEM at high acidity compared to low acidity condition. In addition, the physical properties of SBA-15 showed a decrease of surface area and pore size due to the increase in the pH. Use of HMTA as pH modifier is suitable, due to pH value increases occurred in the hydrothermal processes only. This is because during the hydrothermal process at a temperature of 100°C, HMTA decomposes to NH₃ which in turn increase of the pH value in the silica gel. It can be concluded that the formation of mesoporous silica SBA-15 to some extent been influenced by the pH value. This can be seen from the results of the study show that mesoporous silica type SBA-15 lead to well-ordered hexagonal mesoporous at high acidity and poor order hexagonal pore structure was formed in low acidity condition.

KEYWORDS: HMTA, pH Modification, SBA-15

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