

Choma, J., Jedynek, K., Gorka, J., Jaroniec, M. Adsorption Properties of Mesoporous Carbons with Titania Nanoparticles Obtained in the Presence of Block Copolymers. *Ochrona Srodowiska* 2010, Vol. 32, No. 4, pp. 3–9.

Abstract: The soft-templated mesoporous carbons were successfully synthesized in the presence of titania nanoparticles, with resorcinol and formaldehyde as carbon precursors and triblock copolymer EO₁₀₁PO₅₆EO₁₀₁ as a soft template. Two different loadings of 25 nm titania nanoparticles (0.05 or 0.10 mol) were introduced into the carbon framework. Since titania addition lowers the adsorption volume of the composite materials, the reaction mixture was supplied with TEOS (tetraethyl orthosilicate). Its addition improves porosity by removing the TEOS-generated silica species, without disturbing mesophase formation. The final composite materials exhibit a high surface area (~1000 m²/g) and a large total pore volume (~1 cm³/g), where mesoporosity accounts for ~75–80% of the total pore volume. Pore size distribution curves confirmed the presence of micropores (~2.0–2.1 nm) and mesopores (~6.0–7.0 nm). The well-developed porous structure with embedded titania nanoparticles substantiates the applicability of these composite materials in many catalytic and adsorption processes.

Keywords: Adsorption, synthesis, mesoporous carbon, nanoparticles, titania, block copolymer.