Studi Aktivitas Fotokatalitik dan Karakteristik Nanokomposit Perak-Oksida Nikel-Oksida Cerium Hasil Sintesis dengan Metode Ultrasonic-Assisted untuk Degradasi Metilen Biru = The Study on Photocatalytic Activity and Characteristics of Silver Nickel Oxide-Cerium Oxide Nanocomposites Synthesized by Ultrasonic-Assisted Methods for Methylene Blue

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Abstrak

Pada studi ini, tiga persentase massa dari perak ditambahkan ke nanokomposit oksida nikel dan oksida cerium dengan tiga rasio molar berbeda dari kedua oksida. Nanokomposit telah disintesis menggunakan metode ultrasonic-assisted. Lima teknik karakterisasi digunakan untuk mengevaluasi bahan, X-ray diffraction (XRD), X-ray fluorescence (XRF), UV-Vis diffuse reflectance, Raman Spectroscopy, dan Adsorpsi/Desorpsi Nitrogen. Dua sumber radiasi, cahaya tampak UV digunakan untuk mendegradasi metilen biru sebagai objek polutan untuk aktivitas fotokatalitik. Katalis nanokomposit dengan persentase massa Ag sebanyak 20 wt.% menunjukkan aktivitas fotokatalitik tertinggi. Dalam proses degradasi metilen biru dengan katalis nanokomposit elektron scavenger merupakan spesies aktif utama pada proses degradasi

.....In this study, three different weight percentages of silver were added to the nickel oxide and cerium oxide nanocomposites with three different molar ratios of the two oxides. These nanocomposites were synthesized using ultrasonic-assisted techniques. Five characterization techniques were carried out to evaluate the materials, X-ray diffraction (XRD), X-ray fluorescence (XRF), UV-Vis diffuse reflectance, Raman Spectroscopy, and Nitrogen Adsorption/Desorption. Two radiation sources, visible and ultraviolet, were used to degrade methylene blue as a pollutant object for photocatalytic activities. The nanocomposite catalyst with twenty weight percentages of silver showed the highest photocatalytic activity. In the degradation process of methylene blue with these nanocomposite catalyst that electrons becomes the main active species in the process.