

KAJIAN VARIASI KONSENTRASI $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ PADA SINTESIS Cu-DOPED ZrO_2 DENGAN METODE REFLUKS

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INTISARI

Sintesis dan karakterisasi Cu-doped ZrO_2 sebagai model fotokatalis responsif sinar tampak telah dilakukan. Penelitian ini bertujuan untuk melakukan sintesis material Cu-doped ZrO_2 menggunakan metode refluks, serta mengkaji pengaruh konsentrasi Cu dengan suhu kalsinasi 500 °C terhadap karakter Cu-doped ZrO_2 hasil sintesis.

Penelitian diawali dengan mensintesis Cu-doped ZrO_2 dengan variasi konsentrasi dopan Cu dengan 1 g serbuk ZrO_2 dilarutkan dalam 10 ml akuabides kemudian ditambahkan garam CuSO_4 dengan variasi persentase 0, 4, 6, 8, 10% (b/b). Pada setiap persentase $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ dilakukan kalsinasi pada suhu 500 °C. Material Cu-doped ZrO_2 disintesis menggunakan metode refluks. Material yang di peroleh kemudian dikarakterisasi menggunakan *X-Ray Diffractometer* (XRD) dan *Fourier Transform Infrared Spectrophotometer* (FTIR).

Hasil karakterisasi kristal menggunakan XRD dan FTIR menunjukkan bahwa dalam Cu-doped ZrO_2 terkandung kristal fase monoklinik yang memiliki kestabilan termal tinggi dan menunjukkan variasi konsentrasi dopan Cu^{2+} mempengaruhi sedikit perubahan intensitas puncak dibanding ZrO_2 murni yang disebabkan adanya dopan Cu di permukaan kristal ZrO_2 .

Kata kunci : fotokatalis, refluks, sintesis, tembaga, zirkonium.

STUDY OF $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ CONCENTRATION VARIATION IN THE SYNTHESIS OF Cu-DOPED ZrO_2 WITH REFLUX METHOD

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ABSTRACT

Synthesis and characterization of Cu-doped ZrO_2 as a model of visible light-responsive photocatalyst have been conducted. The main purpose of this research was to get Cu-doped ZrO_2 materials through reflux method and to learn the effect of concentration of Cu with 500 °C calcination temperature to Cu-doped ZrO_2 synthesis product.

The experiments were started started by synthesizing Cu-doped ZrO_2 with various concentration of Cu dopants with 1 g of ZrO_2 powder dissolved in 10 ml of aquabides, then added CuSO_4 salt with various percentage of 0, 4, 6, 8, 10% (w/w). Each percentage of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ was calcined at a temperature of 500 °C. Cu-Doped ZrO_2 material was synthesized using reflux method. The obtained materials were characterized by using X-Ray Diffractometer (XRD) and Fourier Transform Infrared Spectrophotometer (FTIR).

The results of crystal characterization using XRD and FTIR showed that Cu-doped ZrO_2 contained monoclinic phase crystals which had high thermal stability and showed that variations in the concentration of Cu^{2+} dopants affected a slight change in peak intensity compared to pure ZrO_2 due to the presence of Cu dopants on the surface of the ZrO_2 crystals.

Keywords: copper, photocatalyst, reflux, synthesis, zirconia.