Studi Pengaruh Sumber Basa dan Capping Agent pada Sintesis CuBi2O4 Tiga Dimensi (3D) secara Ultrasonik = Study of the Effect of Base Sources and Capping Agents on the Ultrasonic Synthesis of Three-Dimensional (3D) CuBi2O4

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Abstrak

Sintesis CuBi2O4 tiga dimensi (3D) dengan variasi sumber basa dan capping agent secara ultrasonik berhasil dilakukan pada penelitian ini. Secara umum, penelitian ini telah menentukan kondisi optimum cara mensintesis CuBi2O4 meliputi variasi sumber basa, capping agent, dan variasi jumlah capping agent. Penelitian ini telah berhasil mensintesa CuBi2O4 secara ultrasonik dengan variasi sumber basa (NaOH, NH4OH, NaHCO3, dan NH2OH). Sintesis CuBi2O4 dengan variasi basa berhasil dilakukan tetapi CuBi2O4 yang dihasilkan tidak murni 100% pada penggunaan NH4OH, NaHCO3, dan NH2OH karena adanya puncak Bi2O3 pada spektrum XRD. Penggunaan basa NaOH menghasilkan densitas arus sebesar 0,08 mAcm-2. Tahap selanjutnya CuBi2O4 disintesis dengan penambahan variasi capping agent (PVP, PVA, CTAB, CKC). Penambahan PVP menghasilkan densitas arus sebesar 0,24 mAcm-2. Selanjutnya dilakukan sintesis CuBi2O4 dengan variasi jumlah capping agent (0; 0,01; 0,05; 0,075; dan 0,1 gram). Jumlah capping agent (PVP) sebanyak 0,05 gram menghasilkan densitas arus sebesar 0,24 mAcm-2.
.....Three-dimensional (3D) CuBi2O4 synthesis with various base sources and ultrasonic capping agents was successfully carried out in this study. In general, this research has determined the optimum conditions for synthesizing CuBi2O4 including variations in base sources, capping agents, and variations in the amount of capping agents. This research has succeeded in synthesizing CuBi2O4 ultrasonically with a variety of base sources (NaOH, NH4OH, NaHCO3, and NH2OH). The synthesis of CuBi2O4 with various bases was successfully carried out but the CuBi2O4 produced was not 100% pure using NH4OH, NaHCO3, and NH2OH due to the presence of Bi2O3 peaks in the XRD spectrum. The use of NaOH base produces a current density of 0,08 mAcm-2. The next step is CuBi2O4 is synthesized by adding various capping agents (PVP, PVA, CTAB, CKC). The addition of PVP produces a current density of 0,24 mAcm-2. Subsequently, CuBi2O4 was synthesized with variations in the amount of capping agent (0; 0,01; 0,05; 0,075; and 0,1 gram). The amount of capping agent (PVP) as much as 0,05 grams produces a current density of 0,24 mAcm-2.