

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.