CONDUCTIVITY STUDIES OF Fe_2O_3 AND $FeAlO_3$ PREPARED BY SOL GEL METHOD

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ABSTRACT

CONDUCTIVITY STUDIES OF Fe_2O_3 AND $FeAlO_3$ PREPARED BY SOL GEL METHOD

Fe_2O_3 and $FeAlO_3$ were synthesized by sol gel method with Iron (III) nitrate nonahydrate, $Fe(NO_3)_3 \cdot 9H_2O$ and Aluminum nitrate nonahydrate $Fe(NO_3)_3 \cdot 9H_2O$ as the starting materials. The structure of the materials were characterized by XRD (x-ray diffraction) using Xpert Highscore Plus and the conductivity of the materials have been studied using WEIS510 Multichannel EIS (electrochemical impedance spectroscopy) System. The result indicated that Fe_2O_3 was obtained as a pure crystal structure and clearly assigned to α-Fe_2O_3 (hematite). For the $FeAlO_3$ the result shows that the material is obtained as mix-phase.

CHAPTER 1

INTROCUCTION

1.1 Background of study

Nanomaterials are the field that takes a materials science-based approach to nanotechnology. It studies materials with morphological features on the nanoscale, and especially those which have special properties stemming from their nanoscale dimensions. Nanoscale is usually defined as smaller than a one tenth of a micrometer in at least one dimension, (Cristina Buzea et al., 2007) though this term is sometimes also used for materials smaller than one micrometer.

Nanotechnology, or the use of nanomaterials are these materials can mimic surface properties (including topography, energy, etc.) of natural tissues. For these reasons, over the last decade, nanomaterials have been highlighted as promising candidates for improving traditional tissue engineering materials. Importantly, these efforts have highlighted that nanomaterials exhibit superior cytocompatible, mechanical, electrical, optical, catalytic and magnetic properties compared to conventional (or micron structured) materials. These unique properties of nanomaterials have helped to improve various tissue growth over what is achievable today. (Lijie Zhang and Thomas J. Webster, 2008)