Synthesis and characterization of monodisperse β -cobalt hydroxide using sonochemical method

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Abstract

β -cobalt hydroxide can be used as an additive to improve the electrochemical activity of alkaline secondary batteries and catalysts because of its unique physical, electric and catalytic properties. Various synthesis methods currently used for the synthesis of β -$Co(OH)_2$ described in the literature[1],[2],[3] typically produce different sizes of β -$Co(OH)_2$. However, we found that monodisperse β -$Co(OH)_2$ can be synthesized by sonochemical method using cobalt nitrate and hexamethylenetetramine without addictives. In this case, β -$Co(OH)_2$ have a flat plate-like morphology with diameters of 1μm and thicknesses of several tens of nanometer. However, when cobalt acetate or cobalt chloride were used as cobalt source, monodisperse β -$Co(OH)_2$ was not synthesized. The structural and morphological properties of β -$Co(OH)_2$ were characterized by X-ray diffraction(XRD) and scanning electron microscopy(SEM).

References

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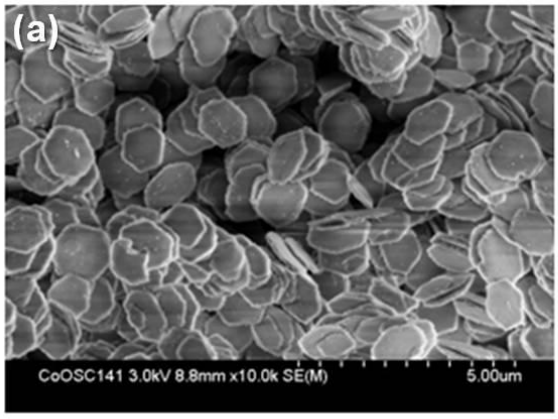
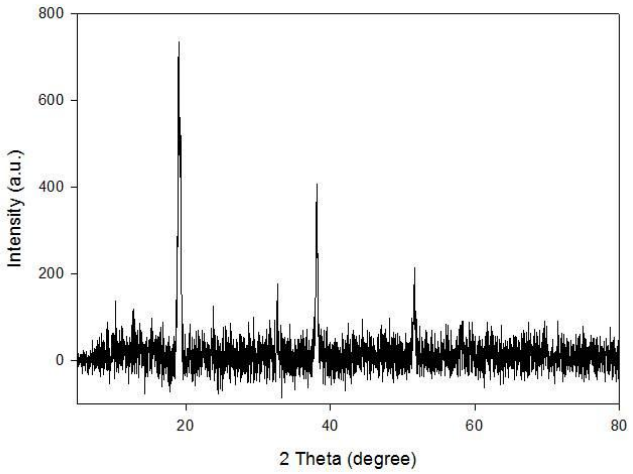
Figures





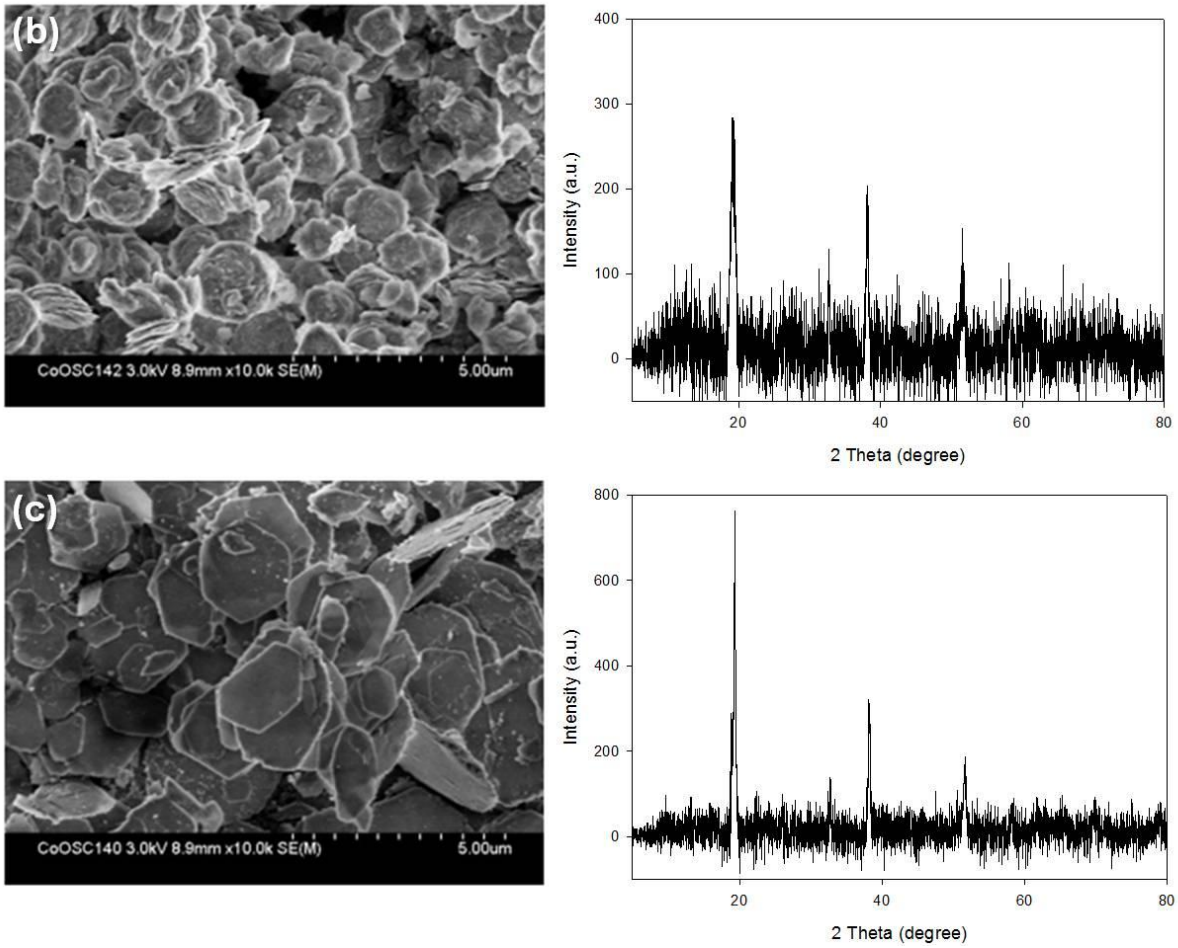


Figure1. SEM images and XRD patterns of β -$Co(OH)_2$ synthesized by using different cobalt source: (a)cobalt nitrate, (b)cobalt acetate, (c)cobalt chloride.

Acknowledgements

This work was supported by the basic research program (13-NB-03) through the Daegu Gyeongbuk Institute of Science and Technology (DGIST), funded by the Ministry of Education, Science, ICT & Future Planning (MSIP) of Korea.