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Diponegoro University (UNDIP),
Semarang State University (UNNES), Sebelas Maret University (UNS) and
Jenderal Soedirman University (UNSOED)

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Green Chemistry

Editors
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Preface to The Conference Proceedings

We are very pleased to introduce The 9th Joint Conference on Chemistry (9th JCC) held by Diponegoro University (UNDIP) On behalf of the Chemistry Consortium in Central Java, Indonesia. The JCC is an annual conference organized by the consortium of Chemistry Department of four universities in Central Java: Diponegoro University (UNDIP), Semarang State University (UNNES), Sebelas Maret University (UNS) and Jenderal Soedirman University (UNSOED); since 2006. The growing of environmental problems that persist to escalate worldwide has compelled us to select “Green Chemistry” as the leading theme of the 9th JCC.

We had 10 plenary speakers, 10 invited speakers and over 120 suitable papers from 11 countries were submitted for presentation at the conference. This required the program to be organized in five parallel sessions, each on a specific theme, to provide each paper with sufficient time for presentation and to accommodate all of them within the overall time allocated. One of the five sessions contained analytical chemistry. A second session was devoted to the theme of biochemistry. The third and fourth session were dedicated to physical and material chemistry. The fifth session was concerned with chemical education. These were well represented in the program of the conference and were clearly topics which continue to stimulate a global interest. The programs were chaired in a professional and efficient way by the session chairmen who were selected for their international standing in the subject.

All the papers went through a peer-review procedure prior to being accepted for publication in this book. These Proceedings present the permanent documentation of what was presented. They indicated the state of advancement at the time of writing of all aspects of this theme and will be very useful to all people in the field.

As a final point, it is appropriate that we record our thanks to our fellow members of the steering committee, organizing committee, and scientific committee. We are also indebted to those who served as chairmen. Without their support, the conference could not have been the success that it was. We also would like to express our sincere gratitude to all authors for their valuable contributions. We are thankful to the students of Chemistry Department Faculty of Science and Mathematics Diponegoro University especially to Maya and Fuad for their support during preparation of the manuscript.

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Proceedings of The 9th Joint Conference on Chemistry

Diponegoro University

Green Chemistry Section 1:
Material Chemistry
Influence of Variation Temperature on Phase Composition of Ca-Mg-Al Hydrotalcite

Eddy Heraldy\textsuperscript{a}, Khoirina Dwi Nugrahaningtyas\textsuperscript{a}, Fendry Bangkit Sanjaya\textsuperscript{a}, Desi Suci Handayani\textsuperscript{a}, Yuniawan Hidayat\textsuperscript{a}

Abstract

The objective of the present study is to assess the influence of temperature variation on phase composition of Ca-Mg-Al hydrotalcite. The temperature variation (50-90 °C) used to Ca-Mg-Al hydrotalcite synthesis from brine water and AlCl$_3$.9H$_2$O by a coprecipitation method. The products were characterized by X-ray diffraction and Fourier Transform Infrared Spectroscopy. Results show that the highest crystallinity of Ca-Mg-Al hydrotalcite when reaction temperature is 90 °C. The reaction temperature is found to greatly affect the product morphology and its phase. With increasing reaction temperature, its crystallinity increased.

Keywords: Ca-Mg-Al hydrotalcite, brine water, reaction temperature, crystallinity

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Introduction

In the desalination process at Coal Fired Power Plant (CFPP), only 40% of sea water can be converted into clean water, while the remaining 60% sea water that called brine water discharged back into the sea as waste. Brine water discharged is more concentrated than seawater.

On the other hand, hydrotalcite (HT) or layered double hydroxides (LDH) is known as one of the minerals of interest, prospective and promising because it can be synthesized easily and are useful in various applications (Kameda et al., 2000; Orthman et al., 2003; Lazaridis, 2003; Yong et al., 2003; Santos et al., 2008). Meanwhile, Mg-Al hydrotalcite have successfully synthesized from brine water as in (Heraldy et al., 2009; 2011), in addition, Gao et al. (2010) was synthesized Ca-Mg-Al hydrotalcite.

With the success as Gao et al. (2010) who has preparation of Ca-Mg-Al-hydrotalcite by combining calcium, magnesium and aluminium ions, brine water utilization (without Ca removal) should be considered further. Therefore, in the present work, Ca-Mg-Al hydrotalcite have been synthesized by variation of reaction temperature.

Methodology

Brine water sample were taken from Tanjung Jati B CFPP, Jepara, Indonesia. All chemicals: AlCl$_3$.6H$_2$O; Na$_2$CO$_3$; AgNO$_3$; HCl 37%; LaCl$_3$ (from Merck, Germany) and aquadest were analytical grade and used as received without further purification.
This is to certify that

Eddy Heraldy

has presented a paper entitled

Influence of Variation Temperature on Phase Composition of Ca-Mg-Al Hydrotalcite

at the 9th Joint Conference on Chemistry held on 12-13 November 2014 in Semarang that organised by Chemistry Department, Diponegoro University

Semarang, 13 November 2014

6th Joint Conference on Chemistry Chair

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