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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Preparation of Natural Zeolite for Air Dehumidification in Food Drying		
Jumlah Penulis	:	3 orang (Mohamad Djaeni, Laeli Laeli Kurniasari, **Setia Budi Sasongko**)		
Status Pengusul	:	penulis ke-3		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	International Journal of Science and Engineering
		b. Nomor ISSN	:	2086-5023 (Print); 2302-5743 (Online)
		c. Vol, No., Bln Thn	:	Vol 8, No 2 (2015)
		d. Penerbit	:	Department of Chemical Engineering University of Diponegoro Semarang
		e. DOI artikel (jika ada)	:	https://doi.org/10.12777/ijse.8.2.80-83
		f. Alamat web jurnal	:	https://ejournal.undip.ac.id/index.php/ijse/article/view/8288
		Alamat Artikel	:	https://ejournal.undip.ac.id/index.php/ijse/article/view/8288/pdf
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Semarang, 10 Agustus 2020

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Semarang, Juni 2020
Reviewer 1

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NIP. 197306211997021001
Unit Kerja : Dept. Teknik Kimia FT UNDIP

Preparation of natural zeolite for air dehumidification in food drying

M Djaeni, LL Kurniasari… - International Journal of …, 2015 - ejournal.undip.ac.id

Drying with air dehumidification with solid adsorbent improves the quality of food product as well as energy efficiency. The natural zeolite is one of adsorbent having potential to adsorb the water. Normally, the material was activated to open the pore, remove the organic impurities, and increase Si/Al rate. Hence, it can enhance the adsorbing capacity. This research studied the activation of natural zeolite mined from Klaten, Indonesia as air dehumidification for food drying. Two different methods were used involving activation by …

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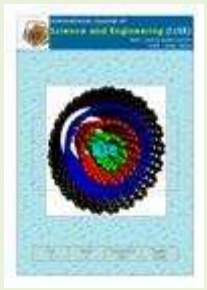

Preparation of Natural Zeolite for Air Dehumidification in Food Drying

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Abstract **-** Drying with air dehumidification with solid adsorbent improves the quality of food product as well as energy efficiency. The natural zeolite is one of adsorbent having potential to adsorb the water. Normally, the material was activated to open the pore, remove the organic impurities, and increase Si/Al rate. Hence, it can enhance the adsorbing capacity. This research studied the activation of natural zeolite mined from Klaten, Indonesia as air dehumidification for food drying. Two different methods were used involving activation by heat and NaOH introduction. As indicators, the porosity and water loaded were evaluated. Results showed both methods improved the adsorbing capacity significantly. With NaOH, the adsorbing capacity was higher. The simple test in onion and corn drying showed the presence of activated natural zeolite can speed up water evaporation positively. This performance was also comparable with Zeolite 3A.

Keywords— *adsorbent, capacity, onion, corn, water loaded*

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Introduction

Drying with air dehumidification using solid adsorbent such as zeolite, silica and activated clay, is a potential option to improve food product quality as well as energy efficiency [1,2]. With air dehumidification, the driving force for water transfer from solid matrix of a product to the air, can improve. Then, the drying can be faster and more efficient in low or medium temperature in which is suitable for retaining nutrition and active compound in food.

Zeolite has the most potential adsorbent for enhancing food and agriculture drying [1,2]. Zeolite is alumino-silicate compound with tetrahedral bound linked by oxygen. Atom Al is negatif that can be neralized by cation. The exchangable cation affects the adsorption ability of zeolite. Beside that, the ability is also influenced by Si/Al ratio, surface area, and size od zeolite pore [3,4,5]. With high surface area and suitable pore for water (3^{o}A), the capacity of zeolite to adsorb water became higher.

In Indonesia, the natural zeolite is commonly found in the market or mining area. Even, the capacity of zeolite production was high [6]. However, adsorbing capacity of natural zeolite is too low rounding 0.07-0.09 gr water loaded per gr zeolite. In general, the natural zeolite contains organic and an-organic impurities, as well as having high Si/Al ratio. Additionally, the size of pore is not homogenous. For adsorbing water, it needs the size pore 3^{o}A close to molecular diameter of water. Therefore, the activation is required before using natural zeolite [7].

This research discusses comparison of two methods for natural zeolite activation (by heat and NaOH). As material, the natural zeolite obtained from Klaten Indonesia, was used. The aim was to find the zeolite with adsorbing capacity upper 0.10 gr water per gr dry zeolite. After activation, the zeolite was then used for onion and

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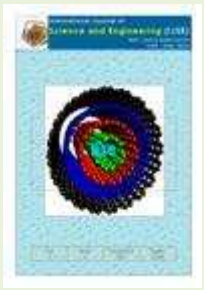

The Effect of Annealing Temperatures after Thermomechanical Process to The Corrosion Behavior of $Ni_3(Si,Ti)$ in Sulfate Solution

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Abstract *- The corrosion behaviour of the intermetallic compounds $Ni_3(Si,Ti)$ ($L1_2$: single phase), has been investigated using an immersion test, polarization method, scanning electron microscope in 0.5 kmol/m^3 H_2SO_4 solution at 303 K. Moreover, the corrosion behaviour of austenitic stainless steel type 304 was studied under the same experimental conditions as reference. It was found that the intergranular attack and uniform attack were observed on $Ni_3(Si,Ti)$ after thermomechanical and annealing processes (1173K and 1273K) respectively in the immersion test. From the immersion test and polarization curves, all annealed $Ni_3(Si,Ti)$ had less corrosion resistance compared to type 304. In addition, $Ni_3(Si,Ti)$ was difficult to form a stable passive film, but not for type 304.*

Keywords *— Intermetallic Compound; Immersion Test; Polarization Curve; Sulfate ion; Corrosion*

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Doi: 10.12777/ijse.8.2.141-145

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Doi: 10.12777/ijse.8.2.141-145*]*

I. INTRODUCTION

An intermetallic compound of $Ni_3(Si,Ti)$ with addition of titanium (Ti) has been considered to be a potential compound which could be applied as high temperature structural materials and chemical parts because this compound shows an increasing strength with increasing operational temperature and also displays remarkable oxidation resistance over a wide range of temperature (Takasugi et al.,1990 ; Takasugi ,2000). Furthermore, this compound has a single phase of $L1_2$ which exhibits a good corrosion resistance (Kaneno et al., 2002). However, Priyotomo and co-workers found the less corrosion resistance of this compound in all acidic solutions where, the types of corrosion are intergranular and uniform (Priyoyotomo et al.,2011 ; Priyotomo et al.,2012). In addition, Wagle (Wagle et al.,2011) and Priyotomo (Priyotomo et al., 2013) also found that the pitting corrosion behavior of the compound with different heat treatment took place in neutral sodium chloride solution. The $Ni_3(Si,Ti)$ intermetallic compounds are susceptible to environmental embritlement (hydrogen embrittlement) at ambient temperature in moist environment (Takasugi et al.,1993a; Takasugi et al.,1993b), where that embrittlement takes place with permeation of atomic hydrogen through electrochemical reaction into the compounds.

Furthermore, the preceding investigation regarding to $Ni_3(Si,Ti)$ carried out the thermomechanical process (TMP) after homogenization process (Takasugi et al., 1990 ; Kaneno et al., 2003). TMP is the combination of deformation process and heat treatment in single system (Poliak et al., 2009). The microstructural control for grain size and texture is possible to be applied by TMP (Kaneno et al.,2003). Priyotomo had already found that the effect of annealing process of Ni3(Si,Ti) after TMP could not enhance their corrosion resistances more effectively in various neutral chloride ion solution (Priyotomo et al.,2013). With regard to $Ni_3(Si,Ti)$ compound, there is little study on the corrosion behavior of $Ni_3(Si,Ti)$ after TMP in aqueous solutions at ambient temperature in sulfate ion (SO_4^{2-}). Therefore, the objective of this work is to elucidate the corrosion behavior of $Ni_3(Si,Ti)$

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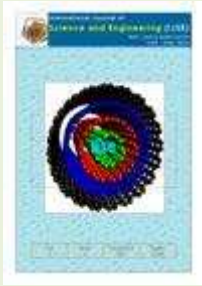

Effects of aligned magneticfield and radiation on the flow of ferrofluids over a flat plate with non-uniform heat source/sink

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Abstract *- In this study we analyzed the influence of radiation and aligned magneticfield on the flow of ferrofluids over a flat plate in presence of non-uniform heat source/sink and slip velocity. We considered Fe_3O_4 magnetic nano particles embedded within the two types of base fluids namely water and kerosene. The governing partial differential equations are transformed into nonlinear ordinary differential equations by using similarity transformation and solved numerically using bvp5c Matlab package. The effects of dimensionless quantities on the flow and temperature profiles along with the friction factor and Nusselt number is discussed and presented through graphs and tables. It is found that present results have an excellent agreement with the existed studies under some special assumptions. Results indicate that a raise in the aligned angle enhances the skin friction coefficient and heat transfer rate.*

Keywords — *MHD, Radiation, Ferrofluids, Non-uniform heat source or sink, Convection*

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Doi: 10.12777/ijse.8.2.151-158*]*

I. INTRODUCTION

Magnetic nanofluids are also called as ferrofluids. Ferrofluids are in the size of 5-15 nm. The main aim of ferrofluids is to controlling the heat transfer and fluid flow. It has potential applications in the field of industrial engineering, aerospace, aeronautical, medical, science and technology (Rosersweig, 1985), Hiegeister *et al.,* 1999). (Jafari *et al*., 2008) illustrated the heat transfer analysis in ferrofluids by using computational fluid dynamics technique. The mesoscale structure analysis of ferrofluids with magnetic nano particles in presence of Brownian motion was discussed by (Xuan *et al.,* 2005). (Lajvardi *et al.,* 2010) examined the convective heat transfer in ferrofluids over a heated copper tube in presence of magneticfield. The influence of external magneticfield on the free convection ferrofluids flow and heat transfer was studied by (Sheikholeslami and Bandpy, 2014).

(Arulmurugan *et al.,* 2006) presented an experimental study on the thermal magnetic properties on ferrofluid flow in presence of Mn-Zn particles. The heat transfer analysis of thermophoretic radiative MHD nanofluid flow past an exponentially stretching porous sheet with heat generation/absorption was discussed by (Sandeep and Sulochana, 2015) and concluded that an increase in the exponential parameter enhances the heat and mass transfer rate. (Raju *et al.,* 2015) illustrated the cross-diffusion effects on steady two dimensional flow over a stretching surface in presence of radiation and magneticfield effects and found that heat and mass transfer rate increase with the increase in Biot number. The effects of elevating laser power on the structural stability and chemical composition of magnetite nano particles in ferrofluids was experimentally analyzed by (Abrashev *et al.,* 2010). (Aminfar *et al.,* 2011) investigated the mixed convection flow of a nanofluid past a vertical tube in presence of non-uniform magneticfield. MHD effect on natural convective heat transfer of Cu-water nanofluid through hot elliptic cylinder was studied by (Sheikholeslami *et al.*, 2014).

(Aminfar *et al.,* 2013) illustrated the non-uniform transverse magneticfield effect of ferrofluid flow and heat transfer analysis past a rectangular duct. A numerical analysis of the magnetic and thermal buoyancy effects on ferrofluid was examined by (Jue, 2006). The convective heat transfer analysis of ferrofluid flow past a micro channels was considered by (Xuan *et al.*, 2007).