

Review Article

## Activities of Heterogeneous Acid-Base Catalysts for Fragrances Synthesis: A Review

H. Hartati<sup>1,2,3</sup>, Mardi Santoso<sup>3</sup>, Sugeng Triwahyono<sup>4</sup>, Didik Prasetyoko<sup>2,5\*</sup>

<sup>1</sup>Department of Chemistry, Faculty of Science and Technology, Universitas Airlangga, Surabaya. 60115

<sup>2</sup>Laboratory of Material Chemistry and Energy, Department of Chemistry, Faculty of Mathematics and Natural Sciences, Institut Teknologi Sepuluh Nopember, Surabaya, 60111

<sup>3</sup>Laboratory of Natural Products and Chemical Synthesis, Department of Chemistry, Faculty of Mathematics and Natural Sciences, Institut Teknologi Sepuluh Nopember, Surabaya, 60111

<sup>4</sup>Ibnu Sina Institute for Fundamental Science Studies, Universiti Teknologi Malaysia, Johor Bahru, Malaysia, 81310

<sup>5</sup>Laboratory of Energy, Center for Energy Studies, Institut Teknologi Sepuluh Nopember, Surabaya, 60111

Received: 20th January 2013; Revised: 31st March 2013; Accepted: 1st April 2013

### Abstract

This paper reviews various types of heterogeneous acid-base catalysts for fragrances preparation. Catalytic activities of the various types of heterogeneous acid and base catalysts in fragrances preparation, i.e. non-zeolitic, zeolitic, and mesoporous molecular sieves, have been reported. Generally, heterogeneous acid catalysts are more commonly used in fragrance synthesis as compared to heterogeneous base catalysts. Heteropoly acids and hydrotalcites type catalysts are widely used as heterogeneous acid and base catalysts, respectively. © 2013 BCREC UNDIP. All rights reserved.

**Keywords:** heterogeneous acid catalysts; heterogeneous base catalysts; fragrances synthesis

**How to Cite:** Hartati, H., Santoso, M., Triwahyono, S., Prasetyoko, D. (2013). Activities of Heterogeneous Acid-Base Catalysts for Fragrances Synthesis: A Review. *Bulletin of Chemical Reaction Engineering & Catalysis*, 8 (1): 14-33. (doi:10.9767/bcrec.8.1.4394.14-33)

**Permalink/DOI:** <http://dx.doi.org/10.9767/bcrec.8.1.4394.14-33>

### 1. Introduction

Until the mid-19<sup>th</sup> century, most perfumes were used personally by rich people due to the quite expensive isolation cost of perfume. In the nineteenth century, the development of organic chemistry has begun to make synthetic chemicals available and their use in perfumery thrived. For example, the nitromusks were discovered by Bauer while he was working on explosives related to TNT. However,

techniques for the isolation, characterization, and chemical synthesis of organic chemicals still improved, therefore the techniques in the searching of new fragrance materials becoming more structured [1].

Nowadays, perfumers can afford to use certain natural products in fine fragrances only. Synthetic chemicals for fragrances are the most available in the market with wide range of prices. For example, the use of cheap perfumery is highly diversified from soaps, detergents to household materials [2]. The high demand of the perfumes led to industry sector to manufacture the synthetic perfume in a large

\* Corresponding Author.

E-mail: didikp@chem.its.ac.id;

didik.prasetyoko@gmail.com (D. Prasetyoko)