

# CATALYTIC ACTIVITY TEST OF Mo-V-Te-Nb-OXIDE IN AMMOXIDATION OF PROPANE TO ACRYLONITRILE

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## ABSTRAK

**Widi, R. K.** 2014. Catalytic activity test of Mo-V-Te-Nb-Oxide in ammoxidation of propane to acrylonitrile

The ammoxidation of propane has been investigated at a multicomponent oxidic, MoVTeNb catalyst in the temperature of 673 K. The catalyst was prepared by sol-gel method, and dried by spray dried method. The activity test of the catalyst has been carried out using micro reactor and showed that it was active for ammoxidation of propane to acrylonitrile.

**Kata kunci : ammoxidation, propane, mixed metal oxide catalyst, acrylonitrile**

## ABSTRACT

**Widi, R. K.** 2014. Uji aktivitas katalisis Mo-V-Te-Nb-Oxide pada ammoksidasi propana menjadi akrilonitril

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## INTRODUCTION

Selective catalytic oxidation and ammoxidation processes of hydrocarbons comprise approximately one quarter of the value produced by all catalytic processes world wide. They contribute hence significantly to the gross national product of industrial countries and afford future opportunities for developing countries. These processes are not only important from a commercial standpoint and their contribution to the well-being of modern mankind, but they also present the opportunity for significant fundamental research. Such research aims at the molecular level understanding of catalytic behaviour, forming a basis for rational design of catalyst improvement of existing processes and the discovery of totally new catalysts and processes (Betahar et al., 1996).

The selective oxidation of lower alkanes to various functionalized molecules has attracted much interest in recent years. Propane partial oxidation to acrylic acid over vanadium pyrophosphate (VPO) catalysts has been reported. Propane oxidation to acrylic acid with heteropolyacids or with their corresponding salts has also been reported. In propane ammoxidation to acrylonitrile, V-Sb oxide catalysts were studied by several researchers and Mo-V-Te-Nb-

oxide catalysts were studied by Ushikubo et al. (Manhua et al., 2000).

This paper limits itself to the activity test of diluted Mo-V-Te-Nb-oxide catalyst for propane ammoxidation processes.

## MATERIALS AND METHODS

### *Catalyst preparation*

#### **Preparation of solution 1 (Mo-V-Te)**

Eleven point two and seven grams of AHM was dissolved in 100 ml of water. This solution was heated up to 353 K. A clear solution was obtained from AHM. This solution was stirred at a speed of 700 rpm. After complete dissolution of the solid, 2.24 g of AMV was added, and 3.37 g of Telluric acid was added after the AMV had dissolved completely.

#### **Preparation of solution 2 (Nb)**

Three point five and four grams of Niobium ammonium oxalate was dissolved in 29 ml of water. This solution was stirred until all solids had dissolved without heating. Solution 1 was heated up to a

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