

## AKTIVITAS KATALIS $Mg_{1-x}Ni_xF_{0,66}(OH)_{1,34}$ PADA REAKSI TRIMETILHIDROKUINON DAN ISOFITOL

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### Abstrak

Pada penelitian ini telah dilakukan sintesis katalis  $Mg_{1-x}Ni_xF_{0,66}(OH)_{1,34}$  ( $x = 0; 0,025; 0,050; 0,075; 0,1$  dan  $0,15$ ) dengan metode sol-gel. Katalis hasil sintesis, struktur kristalnya dikarakterisasi dengan difraktometer sinar-X (XRD), ikatan yang ada dianalisis dengan spektrofotometer Inframerah *Fourier Transform* (FTIR), keasaman katalis ditentukan dengan metode adsorpsi piridin-FTIR, luas permukaan diukur dengan adsorpsi gas  $N_2$  serta diuji katalisis pada reaksi antara TMHQ dan isofitol. Hasil keasaman dengan metode piridin-FTIR menunjukkan adanya sisi asam Lewis dan Brønsted serta kombinasi keduanya. Luas permukaan ( $S_{BET}$ ) katalis terletak pada rentang 26,8840 sampai 490,0306  $m^2/g$ . Aktivitas katalis tertinggi diperoleh pada katalis  $Mg_{0,925}Ni_{0,075}F_{0,66}(OH)_{1,34}$  sebesar 92,69% dengan *yield* benzofuran sebesar 43,12% dan selektivitas terhadap benzofuran 46,53%. Hasil aktivitasnya dipengaruhi oleh jumlah *doping* Ni, *yield* benzofuran dan selektivitas terhadap benzofuran dipengaruhi oleh sisi asam Lewis dan Brønsted.

**Kata kunci:** *Katalis Heterogen, Doping, Ni, Asam Lewis, Asam Brønsted, Reaksi Friedel-Craft, Reaksi antara TMHQ dan Isofitol*

# ACTIVITY OF $Mg_{1-x}Ni_xF_{0.66}(OH)_{1.34}$ CATALYST ON TRIMETHYLHYDROQUINONE AND ISOPHYTOL REACTION

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## Abstract

$Mg_{1-x}Ni_xF_{0.66}(OH)_{1.34}$  ( $x = 0, 0.025, 0.050, 0.075, 0.1$  dan  $0.15$ ) catalysts were synthesized by a sol-gel technique. The catalysts were characterized by X-ray diffraction, the bond in the samples were analysis by FTIR, the acidities were determined by pyridine-FTIR adsorption methode, BET surface area were measured by adsorption  $N_2$  and the catalytic reaction of the samples were tested by trimethylhydroquinone (TMHQ) and isophytol reaction. Acidity test result through pyridine-FTIR showed a Lewis acid band, a Brønsted acid band, and the combination of both. The BET surface area of these catalysts were in the range of 26.8840 to 490.0306  $m^2/g$ . The catalytic activity of  $Mg_{0.925}Ni_{0.075}F_{0.66}(OH)_{1.34}$  catalyst were superior with 92.69% with yield of benzofuran 43.12% and selectivity of benzofuran 46.53% respectively. The catalytic activity were influenced from the amount of doping Ni, yield of benzofuran and the selectivity of benzofuran were influenced from Lewis and Brønsted acid sites.

**Keywords:** *Heterogenous Catalyst, Doping, Ni, Lewis Acid, Brønsted Acid, Friedel-Craft Reaction, Reaction between TMHQ and Isophytol*