

**PENGARUH *HEXADECYLTRIMETHYLAMMONIUM*
TERHADAP KEMAMPUAN ADSORPSI FENOL PADA
ZEOLIT ALAM DAN ZEOLIT ALAM DEALUMINASI**

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RINGKASAN

Zeolit merupakan material aluminosilikat yang mempunyai muatan negatif pada permukaannya sehingga dapat dimodifikasi dengan surfaktan kationik. Surfaktan kationik yang digunakan untuk memodifikasi permukaan zeolit alam adalah *hexadecyltrimethylammonium* (HDTMA).

Modifikasi zeolit dengan HDTMA dilakukan baik pada zeolit alam maupun zeolit alam dealuminasi untuk mengadsorpsi fenol. Zeolit alam dealuminasi diperoleh dengan mereaksikan zeolit alam dengan HCl 6 M dan NH₄NO₃ 2 M. Setelah itu, zeolit alam dan zeolit alam dealuminasi ditambahkan HDTMA dengan konsentrasi 0; 0,125; 0,25; 0,5; and 1 M kemudian digojog dengan kecepatan 150 rpm selama 8 jam. Hasil modifikasi terhadap kedua zeolit tersebut ditentukan melalui pengukuran dengan spektrofotometer IR. Uji adsorpsi terhadap fenol dilakukan pada kedua zeolit termodifikasi dengan menggunakan *shaker* selama 24 jam pada kecepatan 150 rpm. Fenol yang teradsorpsi ditentukan melalui pengukuran menggunakan spektrofotometer UV.

Spektra FTIR menunjukkan bahwa modifikasi dengan HDTMA pada zeolit alam dan zeolit alam dealuminasi telah berhasil dilakukan. Dari penentuan menggunakan spektrofotometer UV diperoleh konsentrasi maksimum fenol yang teradsorpsi sebesar 339,928 mg/L untuk zeolit alam dengan penambahan HDTMA 1 M, dan 239,724 mg/L untuk zeolit dealuminasi dengan penambahan HDTMA 0,5 M. Modifikasi dengan HDTMA pada zeolit alam lebih efektif dalam mengadsorpsi fenol daripada modifikasi HDTMA pada zeolit alam dealuminasi. Secara umum, semakin besar konsentrasi HDTMA yang ditambahkan semakin besar pula konsentrasi fenol teradsorpsi.

SUMMARY

Zeolite is an aluminosilicate material that has a negative charge on its surface therefore it can be modified by a cationic surfactant. The cationic surfactant that used to modify the natural zeolite surface is hexadecyltrimethylammonium (HDTMA).

Modification zeolite with HDTMA was done for both natural zeolite and dealuminated one for phenol adsorption. The dealuminated natural zeolite was obtained by reacted of natural zeolite with HCl 6 M and NH_4NO_3 2 M. After that, natural zeolite and dealuminated natural zeolite were added by HDTMA in concentration of 0, 0.125, 0.25, 0.5, and 1 M. They were mixed on shaker at 150 rpm for 8 hours. The result of modification for both zeolite was determined using IR spectrophotometer. Phenol adsorption test was done for both modified zeolites by mixing on shaker for 24 hours at 150 rpm. Adsorbed phenol was determined by UV spectrophotometer.

FTIR spectra showed that modification of natural zeolite and dealuminated natural zeolite using HDTMA could be done well. From determination using UV spectrophotometer, there were obtained that maximum concentration of adsorbed phenol were 339.928 mg/L for natural zeolite with addition of HDTMA 1 M, and 239.724 mg/L for dealuminated natural zeolite with addition of HDTMA 0.5 M. Modification of natural zeolite was more effective to adsorb phenol than the dealuminated one. Generally, the increasing of HDTMA was added, increasing of adsorbed phenol.

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