

## RINGKASAN

Lempung merupakan material yang berlimpah yang belum dimanfaatkan secara optimal. Lempung mempunyai sifat plastis pada keadaan basah, dimana menunjukkan pengembangan antarlapis yang menyebabkan volumenya meningkat menjadi dua kali lipat, namun tidak mempunyai pori yang permanen, dan kemampuan adsorpsinya rendah. Kekurangan tersebut dapat diatasi dengan mengubah lempung alam menjadi lempung terpillar. Pada penelitian ini disintesis lempung terpillar Al dari lempung alam Banyumas dengan memvariasi rasio Al/lempung dan suhu kalsinasinya dan uji aktifitas adsorpsi lempung terpillar hasil sintesis terhadap larutan indigo karmina

Pilarisasi lempung dilakukan dengan interkalasi polikation Al pada lempung alam yang dilanjutkan dengan kalsinasi. Hasil sintesis dikarakterisasi dengan difraktometer sinar-x. Analisis indigo karmina hasil adsorpsi dilakukan menggunakan spektrofotometer UV-Vis.

Hasil difraksi sinar-x menunjukkan bahwa peningkatan rasio Al/lempung mampu meningkatkan kristalinitas lempung terpillar, tetapi tidak mempengaruhi ukuran *basal spacing*-nya. Peningkatan suhu kalsinasi menyebabkan penurunan kristalinitas dan jarak *basal spacing* lempung terpillar Al. *Basal spacing* yang terbesar dihasilkan oleh lempung terpillar Al pada kalsinasi dengan suhu 300 °C yaitu sebesar 18,03 Å. Uji aktifitas sebagai adsorben indigo karmina menunjukkan dengan meningkatnya suhu kalsinasi pada sintesis lempung terpillar Al menyebabkan kemampuan adsorpsinya menurun. Sedangkan dengan meningkatnya rasio Al/lempung memperbesar kemampuan adsorpsinya. Lempung terpillar Al dengan rasio Al/lempung = 2 dan suhu kalsinasi 300°C mampu mengadsorpsi indigo karmina sebesar 88,45%.

## SUMMARY

Natural clay is a material which has not been optimally exploited yet. Clays have plastic properties in wet condition, it shows interlayer development causing the volume becomes twofolds, but it doesn't have permanent pores, and has low adsorption ability. The problem can be solved by altering natural clay to pillared one. Al-pillared clays have been synthesized from Banyumas natural clays. Al/clay ratios and calcination temperatures were varied to show the effects to pillared clay resulted. The adsorption properties have been evaluated by adsorption of indigo carmine.

Al-pillared clays have been synthesized with intercalation polycation Al to natural clays followed by calcination. The results were characterized by x-rays diffractometer. The amount of indigo carmine after adsorption was analyzed with UV-Vis spectrophotometer.

X-ray diffraction shows that Al-pillared clay crystallinity increased with the increase of Al/clay ratio. Different Al/clay ratio did not influence basal spacing size. Increase of calcination temperature decreased the basal spacing size and the crystallinity of Al-pillared clay. The highest basal spacing was 18,03 Å obtained by which Al-pillared clay was calcinated at 300 °C. Al-pillared clay, as indigo carmine adsorben, was examined to observe the activity. The result showed that increase of calcination temperature caused decline of adsorptivity, while the increase Al/clay ratio boosted the adsorptivity. Al-pillared clay with Al/clay ratio of 2 and calcination temperature 300 °C managed to adsorp indigo carmine as high as 88,45 %.

