ABSTRACT

A research on the synthesis cation exchange material from α-cellulose of rice hull has been done.

Rice hull cellulose was isolated by treating the hull with 5% sodium hydroxide and 5% sodium hypochlorite solutions. Analyses using IR spectroscopy, X-ray diffraction, thermogram profile, and spot tests (Mollisch, Iodium, Fehling, etc.) showed that the isolated material has identically characteristics of microcrystalline cellulose.

As an effort to attach ionogenic group into cellulose, xanthation reaction has been done. In order to study the influence of reagent concentration on the amount of xhantate group attached, the reaction was carried out using different NaOH concentrations (15%, 18%, and 20%). The ammount of xanthate attached was calculated from sulphur content of xanthation products. The sulpur content were $SXJP_{15}$ = 0,5628%, $SXJP_{18}$ = 0,7481%, $SXJP_{20}$ = 0,8908%. The regression equation : y = - 0,4195 + 0,0653 (NaOH). Regression equation shows that the influence of NaOH concentration on sulphur content is 6,53%. Comparison to xanthation product of microcrystalline cellulose shows the influence of cellulose purity as 15,9025%.

To study the influence of pH on xanthation product ion exchange capasity, xanthation products in various pH (3, 4, 5) were applied to Pb and Cd as metal models.

Multiple regression statistical analysis give the regression equation y =- 0,53822 - 0,5603 (pH) + 0,9891 (S) + 0,4778 (metal) + 0,8846 (cellulose). From this equation has known, that the influence of pH on xanthation product ion exchange is 56.03%. It is concluded that the ion exchange capasity increase as the decrease in pH. From this equation, the increase in purity of cellulose and the increase in the amount of xanthate group attached influence on ion exchange capasity. The equation shows that the metal variable gives the lowest influence on ion exchange capasity, so it can be concluded that this cation exchange material can be applied to the other metals.