

SINTESIS KOMPOSIT KULIT PISANG KEPOK DENGAN KARBON AKTIF KULIT SALAK SEBAGAI ADSORBEN ZAT WARNA METILEN BIRU

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INTISARI

Telah dilakukan sintesis komposit kulit pisang kepok-karbon aktif kulit salak (KPK-KAKS) yang digunakan sebagai adsorben metilen biru. Sintesis dilakukan dengan menggabungkan dua material kulit pisang kepok dengan karbon aktif kulit salak berdasarkan perbedaan komposisi kulit pisang dan karbon aktif kulit salak yang ditambahkan yaitu (7:3) dan (5:5) dengan bantuan pelarut aseton. Material komposit dikarakterisasi dengan menggunakan FTIR dan GSA/SAA. Karakterisasi FTIR diperoleh gugus fungsi penyusun material komposit KPK-KAKS (7:3) dan (5:5) yaitu -OH, C=O, C=C dan C-O. Karakterisasi GSA pada komposit KPK-KAKS (7:3) diperoleh luas permukaannya sebesar 1,60863 m²/g dan ukuran pori sebesar 1,69361 nm termasuk dalam mikropori. Studi adsorpsi komposit KPK-KAKS (7:3) & (5:5) menunjukkan massa optimum adsorpsi sebesar 0,03 gram dengan % adsorpsi sebesar 84,605% dan 79,539% dengan waktu optimum selama 35 menit dengan % adsorpsi sebesar 84,498% dan 77,411%. Diperoleh adsorben yang optimum pada variasi adsorben yaitu komposit (7:3). Adsorpsi metilen biru dengan komposit KPK-KAKS (7:3) dan (5:5) keduanya mengikuti model kinetika *pseudo* orde 2. Konsentrasi optimum adsorpsi metilen biru dengan komposit KPK-KAKS (7:3) dan (5:5) dicapai pada 150 ppm dengan % adsorpsi sebesar 91,116% dan 87,482%, dimana keduanya mengikuti model isotherm adsorpsi Freundlich.

Kata Kunci: Adsorpsi, Karbon Aktif, Kulit Pisang, Karbon Aktif-Selulosa

SYNTHESIS of COMPOSITE BANANA KEPOK PEELS WITH ACTIVATED CARBON from SALAK PEELS as ADSORBENT of METHYLENE BLUE

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ABSTRACT

Synthesis composite of banana kepok peel-activated carbon from salak peels has been carried out which is used as a methylene blue adsorbent. Synthesis composite is carried out by combining two materials banana peel with activated carbon from salak peel based on the difference in the composition of banana peel and activated carbon from salak peel added, namely (7: 3) and (5: 5) with acetone as the solvent. Composite materials are characterized using FTIR and GSA/SAA. The characterization of FTIR was obtained by the constituent functional groups of composite materials KPK-KAKS (7: 3) and (5: 5) namely -OH, C = O, C = C and C-O. The characterization of GSA in the KPK-KAKS composite (7: 3) obtained a surface area of 1.60863 m²/g and pore size of 1.69361 nm included in the micropore. The composite adsorption study KPK-KAKS (7:3) & (5:5) showed an with optimum mass 0.03 gram with % adsorption of 84.605% and 79.539% with an optimum time of 35 minutes with % adsorption of 84.498% and 77.411%. The optimum adsorbent obtained in the adsorbent variation is composite (7: 3). The adsorption of methylene blue with the composites KPK-KAKS (7:3) and (5:5) both follow a pseudo-kinetic model of order 2. Optimum concentrations of methylene blue adsorption with KPK-KAKS composites (7:3) and (5:5) were achieved at 150 ppm with % adsorption of 91.116% and 87.482%, both of which followed the Freundlich adsorption isotherm model.

Keywords: *Adsorption, Activated Carbon, Banana Peel, Activated Carbon-Cellulose*