

Sintesis dan karakterisasi Cu²⁺imprinted polymer-ekstrak tanin daun mangga (*mangifera indica* l.) untuk pemisahan selektif ion Cu²⁺ =
Synthesis and characterization of Cu²⁺ imprinted polymer tanin extract from mango leaf (*mangifera indica* l.) for selective separation of Cu²⁺

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Abstrak

Tanaman mangga merupakan tanaman yang tersebar luas di negara tropis seperti di Indonesia. Bagian daunnya mengandung beberapa senyawa metabolit sekunder salah satunya adalah senyawa tanin. Tanin memiliki gugus polifenol yang dapat berfungsi sebagai ligan polifungsional untuk mengkelat logam Cu II . Cu-ion imprinted polymer dari ekstrak tanin berhasil disintesis menggunakan fenol dan formaldehida sebagai crosslinker dan asam sulfat sebagai katalis dan inisiator.

Kestabilan kompleks ekstrak tanin dengan ion Cu II dipelajari dengan metode job dan didapatkan perbandingan mol optimum Cu II :tanin yaitu 1:1. Hasil sintesis Cu-ion imprinted polymer di karakterisasi menggunakan Scanning Electron Microscope SEM, EDS Energy Dispersive X-ray Spectroscopy dan Fourier Transform Infra Red FTIR.

Untuk mengetahui kemampuan adsorpsinya, Cu-ion imprinted polymer hasil sintesis diuji terhadap pengaruh pH dan waktu kontak. Adsorpsi maksimum dari Cu-Ion imprinted polymer dicapai pada pH 7 dan waktu kontak selama 120 menit. Adsorpsi dari Cu-ion imprinted polymer mengikuti model isotherm Freundlich dengan kapasitas adsorpsi maksimum sebesar 99.08 mg/g.

Nilai relatif faktor selektivitas β r dari Cu II /Ni II , Cu II /Pb II dan Cu II /Fe II pada uji selektivitas ion logam tunggal masing masing adalah 23.89, 55.71 dan 26.25 sedangkan pada uji selektivitas ion logam campuran adalah 22.71, 96.48 dan 36.69 yang menunjukkan bahwa hasil lebih besar dari 1 mengindikasikan bahwa Cu-Ion imprinted polymer bersifat selektif. Penggunaan Cu-Ion imprinted polymer memiliki reusibilitas yang baik dengan nilai RSD sebesar 0.52 dan CV Hotwitz sebesar 1.02.

.....Mango plant is a plant that is widespread in tropical countries such as in Indonesia. Part of its leaves contain several compounds are secondary metabolites, one of which is tannin. Tannins have a cluster of polyphenols that can serve as polifunctional ligands for chelating Cu II . Cu ion imprinted polymer of extract tannins successfully synthesized using phenol and formaldehyde as a crosslinker and sulfuric acid as a catalyst and initiator.

The stability of the complex extracts tannins with ion Cu II were studied by the job method and obtained mol comparison optimum Cu II tannins that is 1 1. The results of the synthesis of Cu ion imprinted polymer is characterized with Scanning Electron Microscopy SEM , EDS Energy Dispersive x ray Spectroscopy and Fourier Transform Infra Red FTIR.

To find out the ability of adsorption of Cu ion imprinted polymer, the synthesis result is tested against the influence of the pH and time contact. Maximum adsorption of Cu ion imprinted polymer obtained at pH 7 and contact time at 120 minutes. Adsorption of Cu ion imprinted polymer followed the Freundlich isotherm model with a maximum capacity of adsorption is 99.08 mg g.

The relative values of the selectivity factor β r of Cu II Ni II , Cu II Pb II and Cu II Fe II on a single metal ion selectivity test were 23.89, 55.71 and 26.25 whereas in the test of selectivity of mixed metal ions were

22.71, 96.48 and 36.69 respectively, which are greater than 1 means that Cu ion imprinted polymer is selective. The use of Cu ion imprinted polymer has a good reucibility with the value of RSD is 0.52 and CV Hotwitz is 1.02.