

**APLIKASI AGAROSA HASIL ISOLASI  
DARI AGAR SEBAGAI ADSORBEN  
LOGAM BERAT TEMBAGA (Cu) DAN  
KROMIUM (Cr) PADA ANALISIS  
SPEKTROFOTOMETRI SERAPAN  
ATOM (SSA)**

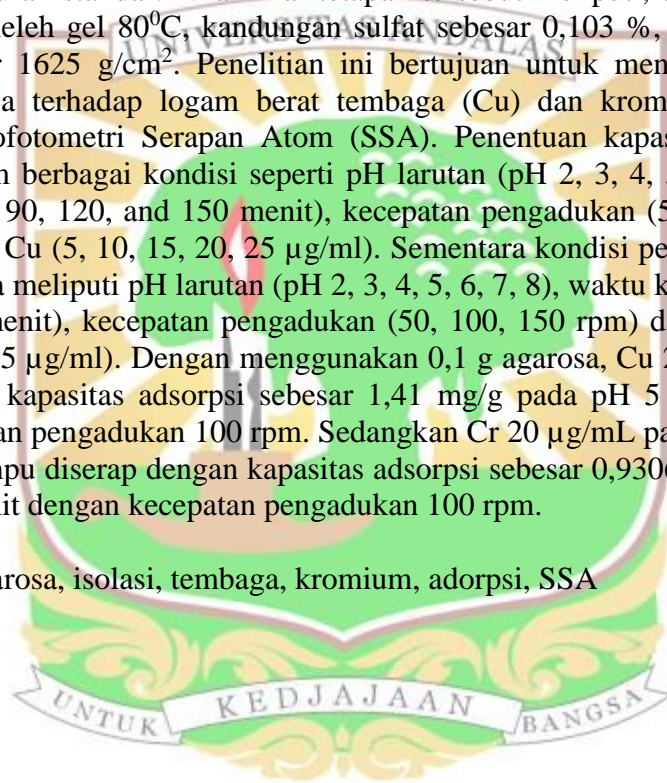


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## ABSTRAK

Isolasi agarosa dilakukan untuk memenuhi nilai-nilai tetapan fisika dan kimia sebagai parameter mutu agarosa yang baik. Agarosa diekstraksi dari alga merah, *Gracilaria gigas* dengan melarutkan tepung agar dalam propilen glikol yang dipanaskan pada suhu 70°C sambil diaduk hingga 105°C untuk mendapatkan larutan homogen 1%. Isopropil alkohol ditambahkan untuk mengendapkan agarosa. Endapan agarosa dipisahkan dengan sentrifugasi lalu disimpan dalam desikator vakum hingga kering. Beberapa tetapan fisika dan kimia agarosa diukur dan ditentukan menggunakan metode pengukuran standar. Nilai-nilai tetapan tersebut meliputi, titik pembentukan gel 40°C, titik leleh gel 80°C, kandungan sulfat sebesar 0,103 %, dan kekuatan gel agarosa sebesar 1625 g/cm<sup>2</sup>. Penelitian ini bertujuan untuk mengetahui kapasitas adsorpsi agarosa terhadap logam berat tembaga (Cu) dan kromium (Cr) dengan analisis Spektrofotometri Serapan Atom (SSA). Penentuan kapasitas adsorpsi Cu dilakukan dalam berbagai kondisi seperti pH larutan (pH 2, 3, 4, 5, 6, 7, 8), waktu kontak (30, 60, 90, 120, and 150 menit), kecepatan pengadukan (50, 100, 150 rpm) dan konsentrasi Cu (5, 10, 15, 20, 25 µg/ml). Sementara kondisi penentuan kapasitas adsorpsi Cr juga meliputi pH larutan (pH 2, 3, 4, 5, 6, 7, 8), waktu kontak (30, 60, 90, 120, and 150 menit), kecepatan pengadukan (50, 100, 150 rpm) dan konsentrasi Cr (5, 10, 15, 20, 25 µg/ml). Dengan menggunakan 0,1 g agarosa, Cu 25 µg/mL mampu diserap dengan kapasitas adsorpsi sebesar 1,41 mg/g pada pH 5 selama 30 menit dengan kecepatan pengadukan 100 rpm. Sedangkan Cr 20 µg/mL pada massa agarosa yang sama mampu diserap dengan kapasitas adsorpsi sebesar 0,9306 mg/g pada pH 4 selama 120 menit dengan kecepatan pengadukan 100 rpm.

Kata kunci: Agarosa, isolasi, tembaga, kromium, adsorpsi, SSA



## ABSTRACT

Isolation agarose was conducted to meet the values of physical and chemical constants as good agarose quality parameters. Agarose was extracted from red algae, *Gracilaria gigas* by dissolving the agar powder with 70<sup>0</sup>C preheated propylene glycol under continuous stirring followed by increasing the temperature to 105<sup>0</sup>C to get homogeneous solution with concentration 1%. Isopropil alcohol was added to induce precipitation of agarose. The agarose precipitated product was then separated by using centrifuge and dried in vacuum desiccator. Some chemical and physical properties of agarose such as gelling and melting point, gel strength, and sulfate content, were measured and determined utilizing standard measurement method. It was found that the gel forming point 40<sup>0</sup>C, the melting point of the gel 80<sup>0</sup>C, the sulfate content 0.103%, and the gel strength 1625 g/cm<sup>2</sup>. This study is to determine the adsorption capacity of agarose to heavy metals copper (Cu) and chromium (Cr) by Atomic Absorption Spectrophotometri analysis (AAS). Prior to analysis the adsorption of Cu by agarose were performed with various conditions such as pH value of solutions (pH 2, 3, 4, 5, 6, 7, 8), duration of adsorption process (30, 60, 90, 120, and 150 min), stirring rate of adsorption process (50, 100, 150 rpm) and concentrations of Cu (5, 10, 15, 20, 25 µg/ml). Meanwhile the adsorption experiments of Cr by agarose were conducted with various conditions such as value of solutions (pH 2, 3, 4, 5, 6, 7, 8), duration of adsorption process (30, 60, 90, 120, and 150 min), stirring rate of adsorption process (50, 100, 150 rpm) and concentrations of Cr (5, 10, 15, 20, 25 µg/ml). Using 0.1 g of agarose, Cu 25 µg/mL was adsorbed with an adsorption capacity of 1.41 mg/g at pH 5 for 30 min under stirring 100 rpm. While Cr 20 µg/mL in the same mass of agarose was able to be adsorbed with an adsorption capacity of 0.9306 mg/g at pH 4 for 120 min under stirring 100 rpm.

Key words: Agarose, isolation, copper, chromium, adsorption, AAS