

# Sintesis dan karakterisasi nanopartikel Cu-Cysteine untuk deteksi cepat 3-Monochloropropanediol berbasis analisis kolorimetri = Synthesis and characterization of nanoparticle Cu-Cysteine for rapid detection of 3-Monochloropropanediol based on colorimetric analysis

Agan Auliya Rahman, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20518966&lokasi=lokal>

---

## Abstrak

Senyawa 3-monochloropropanediol atau 3-MCPD merupakan senyawa kontaminan pada minyak goreng, yang menyebabkan resiko pada kesehatan manusia, karena bersifat karsiogenik. EU regulation telah membuat aturan maksimal 3-MCPD pada makanan yaitu 2,5ppm. Pengujian kandungan 3-MCPD yang telah ada saat ini, berbasis kromatografi gas, namun mahal, kompleks, dan membutuhkan operator yang berkualifikasi. Pendeteksian senyawa 3-MCPD menggunakan nanopartikel berbasis kolorimetri mendapat perhatian, salah satunya nanopartikel logam yang memiliki sifat sensitif terhadap senyawa yang dideteksi. Pada penelitian ini, deteksi dilakukan dengan nanopartikel tembaga dengan L-sistein sebagai capping agent. Sintesis nanopartikel tembaga dilakukan dengan berbagai variasi untuk mendapatkan hasil yang optimal seperti stokiometri, atmosfer, dan pengenceran. Pita LSPR nanopartikel tembaga dengan ligan L-sistein (Cys-CuNPs) diamati menggunakan UV-visible (UV-Vis). Selanjutnya karakterisasi Fourier-transform infrared spectroscopy (FTIR) dan dynamic light scattering (DLS) dilakukan untuk mengamati interaksi antara nanopartikel tembaga dengan L-sistein serta ukuran partikel Cys-CuNPs. Selanjutnya penelitian ini, dilakukan evaluasi sensitivitas nanopartikel Cys-CuNPs terhadap 3-MCPD.....3-Monochloropropanediol (3-MCPD) is a contaminant in edible oil that can pose a risk to human health, because it is carcinogenic. EC regulations have set a maximum limit of 2,5ppm of 3-MCPD on food. The current assay of three-MCPD, based on gas chromatography, is expensive, complex, and requires a qualified operator. The detection of 3-MCPD compound using nanoparticles with colorimetric based has received attention, one of which is metal nanoparticles with sensitive to the detected compounds. In this research, detection was carried out with copper nanoparticles with L-cysteine as a capping agent. The synthesis of copper nanoparticles has been tried with various variations to obtain optimal results such as stoichiometry, atmosphere, and dilution. LSPR bands of copper nanoparticles with L-Cysteine (Cys-CuNPs) were observed using UV-Visible (UV-Vis). In addition, Fourier transform infrared spectroscopy (FTIR) and dynamic light scattering (DLS) were employed to study the interactions between copper nanoparticles and L-cysteine, as well as the particle size of Cys-CuNPs. Furthermore, the sensitivity of Cys-CuNPs to 3-MCPD was evaluated.