

# Pengaruh Konsentrasi Asam Klorida (HCl) terhadap Dispersibilitas, Solubilitas, dan Toksisitas Carbon nanotube Terfungsionalisasi sebagai Penghantar Obat Kanker = The Effect of Hydrochloric acid (HCl) Addition on Dispersibility, Solubility, and Toxicity of Functionalized Carbon nanotube as Drug Delivery Material for Cancer

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## Abstrak

Aplikasi Carbon nanotube (CNT) dalam metode pengobatan kanker dapat dilakukan karena menghasilkan selektivitas dan efektivitas targeting obat yang tinggi.

Fungsionalisasi CNT diperlukan untuk memperbaiki dispersibilitas, solubilitas, dan toksisitas CNT. Fungsionalisasi dilakukan secara kovalen dengan oksidasi asam yang terdiri dari campuran HNO<sub>3</sub> dan H<sub>2</sub>SO<sub>4</sub> dengan penambahan asam klorida (HCl).

Variasi yang dilakukan adalah konsentrasi HCl 6M, 8M, 10M, dan 12M pada suhu sonikasi C. CP--f dikarakterisasi dengan uji dispersi, Fourier Infrared Transformation Spectroscopy (FTIR), Thermal Gravimetry Analysis (TGA), UV--Vis Spectroscopy, Electron Microscopy--Energy Dispersive Spectroscopy (SEM--EDS), dan Brine Shrimp Lethality Test (BSLT). Hasil penelitian menunjukkan bahwa CP--f dengan penambahan HCl 10M (CPf--3) menghasilkan persen solubilitas tertinggi 11,46% dan suspensi dispersi yang paling stabil pada hari ke--51. Disamping dari peningkatan dispersibilitas dan solubilitas, morfologi sampel CPf--3 membentuk beberapa aglomerat yang mengarahkan pada kemunculan sifat dengan nilai LC<sub>50</sub> 355,62 ppm

.....Carbon nanotube application in cancer treatment methods is selected due to its high selectivity and effectivity in drugs targeting delivery. Functionalization is needed to improve dispersibility, solubility, and toxicity of CNT. CNT is treated covalently by oxidation which consist of HNO<sub>3</sub> and H<sub>2</sub>SO<sub>4</sub> with the addition of HCl. Variation is performed in HCl concentration of 6M, 8M, 10M, and 12M at sonication temperature of The addition of HCl in certain molarity increase the purity and dispersion time on functionalized CNT (CP--f). CP--f were characterized through dispersion test, Fourier Infrared Transformation Spectroscopy (FTIR), UV--Vis Spectroscopy, Thermal Gravimetry Analysis (TGA), Electron Microscopy--Energy Dispersive Spectroscopy (SEM--EDS), and Brine Shrimp Lethality Test (BSLT)The study resulted that CP--f with HCl 10M addition (CPf--3) produce the highest solubility for 11.46% and the most stable dispersion suspension in 51 days. Besides, CPf--3 morphology shows some agglomerates which indicate to toxicity with LC<sub>50</sub> of 355,62 ppm