

Copper-Binding Peptide-Fragment-Containing Membrane as a Biocatalyst Prepared by Radiation-Induced Graft Polymerization

Tadashi Okobira¹, Takashi Kadono^{1,2}, Tomoko Kagenishi¹,
Ken Yokawa², Tomonori Kawano² and Kazuya Uezu^{2,*}

¹Fukuoka Industry, Science & Technology Foundation (Fukuoka IST)

²Department of Life and Environment Engineering, Faculty of Environmental Engineering,
The University of Kitakyushu, Kitakyushu, Fukuoka, Japan

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The GlyGlyHis (GGH) peptide was introduced to glycidyl methacrylate (GMA)-grafted porous hollow fiber membrane made of polyethylene by radiation-induced graft polymerization. The GGH density in the membrane was 0.352 mmol/g-membrane. The copper sulfate solution was permeated outward through the GGH peptide-containing membrane, and Cu(II) was adsorbed on the membrane. Chemiluminescence between cypridina luciferin analog (CLA) and superoxide from the catalytic reaction with H₂O₂ and tyramine on the membrane was measured, and the Cu-binding GGH peptide-containing membrane exhibited a very strong chemiluminescence response. Furthermore, we evaluated the molecular structure of the repeating unit model of the Cu-binding GGH peptide-containing polymer brush without trunk polyethylene by computational chemistry.

*Corresponding author: e-mail: uezu@env.kitakyu-u.ac.jp