ISGC 2019
May 13th - 17th

N°117 / PC
TOPIC(s) : Homogenous, heterogenous and biocatalysis / Chemical engineering

Peptide selectively precipitates metallic gold from a homogenous aqueous solution containing platinum ions as contaminants

AUTHORS
Kin-ya TOMIZAKI / RYUKOKU UNIVERSITY, SETA-OE, OTSU
Masahiro ASANO / RYUKOKU UNIVERSITY, SETA-OE, OTSU

PURPOSE OF THE ABSTRACT

Noble metals are used as electrodes, catalysts, and imaging agents as well as decorative items. However, limited production of such noble metals accelerates the development of the noble metal recovery methods from electronic materials and liquid wastes. In these days, noble metal species are separated by liquid-liquid extraction method, ion exchange method, and electrowinning method. However, the recovering methods of noble metals from homogenous aqueous solutions with low metal concentrations are still attractive.
In the previous studies, we found that an aromatic ring-containing 9-residue-peptide formed self-assembled nanostructures and reduced gold ions along the structures to afford anisotropic gold nanocrystals in diluted/homogenous aqueous solutions [1-3]. In this study, the aromatic ring-containing peptide and its derivatives were applied to develop selective separation/recovery method of gold element from a mixture of gold and platinum ions. However, peptides are generally so expensive that new molecular design would be promised for industrialization. Therefore, we synthesized all of the possible fragments of the original 9-residue-peptide by deleting amino acids one by one from both N- and C-termini for downsizing of the peptides, and conducted selective gold recovery from a mixture of gold and platinum ions to find the minimum structures for the activity.

This work was in part supported by 2018 the Joint Research Center for Science and Technology of Ryukoku University, Japan.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

peptide | noble metal recovery | gold | platinum

BIBLIOGRAPHY

[1] Tomizaki, K.-Y.; Wakizaka, S.; Yamaguchi, Y.; Kobayashi, A.; Imai, T. Langmuir, 2014, 30, 846-856.

[2] Tomizaki, K.-Y.; Kishioka, K.; Kobayashi, H.; Kobayashi, A.; Yamada, N.; Kataoka, S.; Imai, T. Bioorg. Med. Chem. 2015, 23, 7282-7291.

[3] Tomizaki, K.-Y.; Nanbu, R.; Kasuga, M.; Imai, T. Protein Peptide Lett., 2018, 25(1), 48-55.