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Synthesis of a ^{188}Re–HEDP Complex Using Carrier-Free ^{188}Re and a Study of Its Stability and Biological Distribution[1]

M. Y. Nassar*[a], M. T. El-Kolaly[b], and M. R. H. Mahran[c]

[a] *Chemistry Department, Faculty of Science, Benha University, Benha 13518, Egypt; e-mail: m_y_nassar@yahoo.com*
[b] *Labeled Compounds Department, Hot Laboratories Centre. Atomic Energy Authority, Egypt*
[c] *National Research Centre, Dokki, Cairo, Egypt*

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Abstract—Labeling of disodium dihydrogen 1-hydroxyethane-1,1-diphosphonate (HEDP) with ^{188}Re was studied. Stannous chloride was used as a reducing agent for the reduction of $^{188}ReO_4^-$. The dependence of the yield of ^{188}Re–HEDP complex upon the HEDP concentration, tin(II) content, reaction time, amount of antioxidant, pH, reaction temperature, and presence of carrier was examined. The optimum conditions ensuring high labeling yield of ^{188}Re–HEDP complex (91.0% with carrier-free Re and 96.5% with carrier-added Re) are as follows: 15 mg of HEDP, 2 mg of Sn(II), 4 mg of ascorbic acid, pH 1.2, 100°C, 10 min. The amount of the carrier added is 200 μg of $KReO_4$. The ^{188}Re–HEDP complex prepared at 100°C is more stable than that prepared at 30°C, and the carrier-added ^{188}Re–HEDP complex is more stable than the no-carrier-added complex.

Keywords: rhenium-188, HEDP, stability, bone uptake

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