

INDICATOR TUBES FOR CONTROL OF RADIOPHARMACEUTICALS

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Tedious laboratory analyses should therefore be replaced by cheap, rapid and reliable methods for immediate on-site determinations. In Moscow State University new test-systems, which are based on original test tools – indicator tubes, have been recently elaborated for determination of various analytes. These test tools have been suggested based on the use of small glass tubes (1-2 mm i.d. – 50-70 mm) filled with indicator powders containing suitable immobilized chromogenic reagents. An analytical signal (a length of coloured zone, which is proportional to the concentration of an analyte) is detected after a sample passing through the indicator tube. The development of simple, inexpensive, and rapid methods for analyses of radiopharmaceuticals, including tin (II) determinations, is an important problem. In this work possibilities of indicator tubes for pharmaceutical analyses have been investigated.

The radiopharmaceutical ^{99m}Tc -labelled human serum albumin (^{99m}Tc -HSA(Sn)), is intended for studies of the haemodynamics, this is under development at the MRRC RAMS. The radiopharmaceutical ^{99m}Tc -HSA(Sn) is prepared at a hospital immediately before their injection to a patient using a reaction of a starting diagnostic composition (kit) with a solution of sodium pertechnetate (^{99m}Tc). Kit is a sterile, pyrogen-free lyophilised HSA(Sn). A content of tin (II) in kit is very important characteristic. The determination of tin (II) in kit is a complicated analytical problem because tin (II) occurs in the presence of large excess of albumin and is easily hydrolyzed and oxidized with ambient oxygen. The amount of tin (II) in the flask is small and varies from 10 to 60 μg , and the amount of the sample is limited.

Heteropoly compounds are well-known analytical reagents for a photometric determination of various reductants. For elaboration of indicator tubes an ability of Mo,P-heteropoly compounds to give deeply colored blue compounds on reduction was used. Silica xerogels modified with Mo,P-heteropoly compounds have been prepared and studied [1]. It was found that the oxidizing properties of these compounds enhance after immobilization. Indicator tubes for determining 10-60 μg tin (II) in kits for preparing radiopharmaceutical have been developed. Time of analyses: 5 min. The test system developed was certified by the State Committee of Standardization and Metrology of Russian Federation and was included to the official list of types of test systems (TS 12-99).

1. Morosanova E.I., Velikorodny A.A., Kuz'min N.M. and Zolotov Yu.A. RF Patent 98113445, 1998, Byull. Izobret., 1999, N 28.