THE EXTRACTION PHOTOMETRIC DETERMINATION
OF MERCURY (II) WITH 4,7-DIPHENYLPHENANTROLINE
AND 2,4-DINITROBENZOLAZOPYROCATECHOL

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The ions Hg (II) as the mild lewis acids form the stable complexes with the sulfur
containing ligands. So, the dithizonate of mercury, for instance, yields only to Ag (I)
by its stability, but the chelates Hg (II) with diethylthiocarbamate are, in general
more stable than all the known chelates with the given reagent.

The reagents containing N and O as the donor atoms are of less significance in the
analytical chemistry of mercury. Our investigations have shown that Hg (II) with
nitrogen containing ligands, for example, aromatic diamine, form the stable
colourless chelate as well. The colour less bisolinate complexes of mercury with
the anions of the chromophore reagents form the outer spheric diverse ligand
complexes DLS fit to its extraction – photometric determination.

In the present work the results of the spectrometric investigation of the diverse
ligand complex of mercury with one of the representatives of the aromatic
diamines by 4,7- diphenylphenanthroline (batophen) and chromophore organic
reagent, by 2,4-dinitrobenzolazopyrocatechol ((DNBAP) are cited. It is
established that Hg (II) with batophen and DNBAP under pH 4.7 form RLC
extracting well with the mixture (4:1) of toluol with dichlorethane. The extraction
photometric method of determination permitting to define 1-20 mg/kg of mercury in
the volume of water phase in 20 ml, has been worked out. The influence of the
outside ions on the accuracy of determining mercury with the indicated reagents,
has been established. The method has been employed for determination of mercury
in the air of the buildings in which there are the deurices working with mercury.
There 39.43±5 and 17±0.2 mg/kg/m³ of mercury have been discovered.

The molar coefficients of adsorption ($\alpha_k = 58000$) and the constant of stability of
the complex ($\beta_k = 8.6 \times 10^6$) have been calculated.