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## Automatic amperometric titration method for quantitative determination of zinc oxide in ointments

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### Abstract

**Background:** Zinc is an important trace mineral in human body, therefore development of new methods for zinc determination in drugs is an actual task.

**Material and methods:** Assay of standard solutions of zinc ions and solutions of ointments to be analyzed was performed automatically using the titrator TITRION, which recorded, then displayed on the screen each amperometric titration curve. The titration curves had a sudden break in the current intensity at the equivalence point, caused by anodic oxidation of the titrant and cathodic reduction of  $H^+$  at pH 3 – 4. The stoichiometry of  $Zn^{2+}$  ion sedimentation reaction with  $[Fe(CN)_6]^{4-}$  ions was studied and confirmed in the presence of the background electrolyte and the ZnO calculation formulas in the analyzed ointments were deduced.

**Results:** Two different ointment masses were weighed for the Zoxitin ointment and the separate calculation results were  $0.4172 \pm 0.0051$  g/g and  $0.4212 \pm 0.0051$  g/g of ointment, and in the zinc oxide ointment  $\omega(ZnO)$  was  $10.208 \pm 0.078$  %. These results were compared with the results of ZnO analysis in ointment by the classical complexometric titration method. For the Zoxitin ointment  $m(ZnO)$  was  $0.4223 \pm 0.007$  g/g of ointment, and for the ointment with ZnO  $\omega(ZnO)$  was  $10.18 \pm 0.11$  %.

**Conclusions:** An automatic amperometric titration method was developed to quantify ZnO in ointments. The method is based on the sedimentation reaction of zinc ions with potassium ferrocyanide solution in presence of acetate buffer solution as background electrolyte.

**Key words:** automatic amperometric titration, zinc oxide, quantitative determination of Zn.

### Cite this article

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