

# SPNHC

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## Collection Forum

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### PAPERS

#### THE EFFECT OF PROPYLENE GLYCOL ON ETHANOL CONCENTRATIONS DETERMINED BY DENSITY MEASUREMENT

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Abstract.-The effect of propylene glycol on the densities of ethanol water-propylene glycol solutions has been determined. From the data, and from tables of density of ethanol-water solutions, the effect of propylene glycol on indicated ethanol concentrations, obtained through measurements of density, was determined.

For most purposes this effect is thought to be small enough to be neglected in all but the most exacting work.

#### STUDIES OF THE RUSSELL EFFECT: PART 1. PROCEDURE AND APPLICATIONS

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Abstract.-Procedures for using the Russell Effect for qualitative analyses were developed by extrapolation of published information and by testing different materials to define the working parameters of the technique. A description of an appropriate procedure is given, as well as examples of its application for (1) detecting differential oxidation rates within various parts of some museum materials, (2) comparing oxidation rates of similar materials used in museums. and (3) comparing oxidation rates resulting from different treatments of museum materials.

#### STUDIES OF THE RUSSELL EFFECT: PART II. INTERPRETATION AND REPRODUCIBILITY

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Abstract.-The Russell Effect is a photographic response of sensitized film to peroxide exposure. Although it can be a valuable, non-destructive indicator of oxidation levels of various materials, its use has been restricted by problems of interpreting the significance of image densities as well as problems of documenting and replicating results. Series of hydrogen peroxide solutions of various concentrations were used to create different

image densities. These were used to evaluate variables that can influence Russell Effect images. It was determined that standardization of the sensitizing procedures can allow close reproducibility of Russell Effect images for a given set of circumstances. Also, it was speculated that hydrogen peroxide concentration gradients could be used to effectively compare levels of oxidation between different observations.

#### IONISING RADIATION ASSOCIATED WITH THE MINERAL COLLECTION OF THE NATIONAL MUSEUM OF WALES

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Abstract.-Measurements of radiation and radon gas levels in the Mineral Store at the National Museum of Wales indicated that amounts were sufficiently high for the Ionising Radiations Regulations to apply (The Ionising Radiations Regulations, 1985). Radiation surveys of the Mineral Collection of the National Museum of Wales were carried out for both direct gamma radiation levels and for radon contamination. Whole body gamma ray dose rates of up to 90  $\mu\text{Sv hr}^{-1}$  and radon levels of 750  $\text{Bq m}^{-3}$  were measured. At these levels the 1985 ionising Radiation Regulations of the United Kingdom required steps to be taken for radiation dose restriction. Following these measurements, rules, drawn up in June 1986, to limit access to the Mineral Store and its radioactive specimens were considered unsatisfactory. Additional measures were taken in 1989 and 1992 to further minimise radiation exposure to staff using the Mineral Collection. In 1989, radioactive specimens were segregated to a section of the Mineral Store allocated for them. Two criteria were used to identify specimens for segregation. The first criterion was whether a specimen included a known radioactive species; tables of approved uranium and thorium mineral names, synonyms and obsolete terms were drawn up for this purpose. The second criterion was whether a specimen contained sufficient adventitious radioactivity to be readily detectable above background. A radiation contamination monitor was used for this and adventitious radioactivity was detected in rare-earth (lanthanide) minerals and other specimens. In 1992, an isolation store, equipped with radon purging ventilation, was established at the National Museum of Wales, and the segregated radioactive specimens from the Mineral Collection were transferred there. Radioactivity no longer presents a hazard in the main Mineral Collection and access to it, formerly subject to dose limitation rules, has ceased to require radiation safety restrictions.

#### Reviews

- Materials for Conservation, by C. V. Horie
- Curacion Moderna de Colecciones Ornitológicas, by Patricia Escalante-Pliego, ed.
- Preserving Natural Science Collections: Chronicle of Our Environmental Heritage, by W. D. Duckworth, H. H. Genoways, and C. L. Rose, eds.