6th Indoor Air Quality 2004 Meeting (IAQ2004) Padova, Italy, 10-12 November 2004-06-27

influence of 2003 heatwave on silver tarnishing

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The influence of climate and atmospheric pollution during the 2003 heatwave on the corrosion rate of silver has been studied in a museum. Two showcases and one exhibition room are compared to evaluate the protection of the showcases towards the pollutants of the exhibition room.

Ag, Cu and Pb coupons were exposed and analysed **through** surface analysis techni**ques** (XPS and XRD). The corrosion products give information on the pollutant source of the corrosion.

Real time monitoring gives a quantitative information of the global corrosion potentiality of the atmosphere. The corrosion rate is **measured through** the increase in electrical resistance upon corrosion of 250 nm thick silver strip or 25 nm thick copper strip exposed to the environment.

An increase of the corrosion rate of silver was noticed after the heatwave of summer 2003, possibly due to a climatic change. Therefore **the** climate in **one** showcase **"A"** was compared to **the** climate in **the** room **"B"** and climate in **another** showcase **"C"**. **The c**limate before heatwave was also compared to **the** climate during heatwave.

The corrosion rate of silver in showcase **A** was lower than in **the** room B **where the showcase A was situated**, meaning a protection of **the** showcase ~~**A**~~ towards external pollutants. **As the** atmospheric pollution **is** supposed to be responsible for this change in corrosion rate, outdoor NOx, O3, SO2 concentrations before and after the heatwave were compared.

The corrosion rate was greater in showcase A than in showcase C, meaning an internal pollution in showcase A. Display materials in showcase were analysed and compared to display materials in showcase C.

The corrosion rate of copper and silver in a climatic chamber and in a pollution chamber have also been studied to show the relationship between corrosion rate, climate and gaseous pollution.