Luminescence of opals: A witness to their geochemistry

E. FRITSCH[1], E. GAILLOU[1,2], F. MASSUYEAU[1] AND B. RONDEAU[3]

[1]Universite de Nantes-CNRS, Institut des Matériaux Jean Rouxel (IMN) – UMR 6205, 2 rue de la Houssinière, BP 32229, 44322, Nantes Cedex 3, France (*correspondence: emmanuel.fritsch@cnrs-imn.fr)
[2]Smithsonian Institution, NMNH, 10th and Constitution NW Washington DC 20560-0119
[3]Université de Nantes-CNRS, LPGN - UMR 6112

There are two main features seen commonly in the ultraviolet luminescence of gem opals, one being a blue emission, the other a green one. The blue is due to a combination of two emissions with maxima at 414 and 460 nm coming from intrinsic, surface-related silica defects. The green one results from uranyl emission, if U concentration exceeds about 1 ppm. Both can be quenched by iron, if there is more than 2000 ppm present [1].

The blue luminescence of most gem opals is explained by the low levels of iron and the virtual absence of uranium in some sedimentary deposits, such as those of southern Australia. By contrast, volcanic deposits provide opals that are either inert due to their high Fe content, or fluoresce green, because of the presence of uranium. Uranium luminescence is often seen in common opal, but is almost inexistent in gem opals exhibiting diffraction of visible light.

[1] Gaillou *et al*. (2008) *Ore Geology Reviews* **34**, 113–126.

Turnover of mineral-free and mineral-associated organic matter in a soil warming experiment in Northern Sweden

MATS FRÖBERG[1]*, CHARLOTTE BRYANT[2] AND DAN BERGGREN KLEJA[1]

[1]Swedish University of Agricultural Sciences, Department of Soil and Environment, P.O. Box 7001, SE 750 07 Uppsala, Sweden (*correspondence: mats.froberg@mark.slu.se)
[2]NERC Radiocarbon Facility (Environment), Scottish Enterprise Technology Park, Rankine Avenue, East Kilbride, Scotland, G75 OQF, United Kingdom

After 14 years of experimental soil warming in a Spruce forest in Northern Sweden, soils were sampled in autumn 2009. Density fractionation of the E and B horizons separated soil particles into light (mineral-free) and heavy (mineral-associated) organic particles. ^{14}C analyses were made on the different fractions and on O horizon soil samples, with the aim of studying how experimental warming had affected different soil pools. The results from the density fractionation and ^{14}C analyses will be presented.