Dissolved gradients in thin films

and its application in environmental monitoring

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Dissolved Gradients in Thin flms and its appli\fation in environmental monitoring

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enerdì 5 maggio 2017 ore 10:30
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Anthropogenic emissions have perturbed or enhanced biogeochemical cycles of many toxic substances. The fluxes between their natural reservoirs are shifting, as is their distribution in the environmental compartments. In the light of the ongoing environmental change one of the main concerns is how will their interaction and accessibility to the biota evolve. Effective and focused environmental monitoring can help elucidate the sources leading to enhanced bioaccumulation and negative effects on ecosystem and eventually human health.

Investigations of the so-called bioaccessible fractions are often hampered by their extremely low environmental concentrations, which dictate use of contamination-prone clean laboratory techniques and sensitive detection equipment. Dissolved Gradients in Thin films (DGTs) is a technique relying on the first Fick's law of diffusion to sample labile and dissolved species in aqueous environments. The diffusion process mimics transport across cellular membrane. It is being increasingly used in monitoring of environmental pollution due to its robustness, versatility, precision and capacity to preconcentrate trace-level pollutants. We focus on mercury- and platinum group elements-specific DGTs to improve our understanding of their biogeochemical cycling. We present aqueous and atmospheric DGT applications to show their potential to monitor environmental pollution.