

New developments in geo-environmental research: magnetic proxies for screening and monitoring of environmental pollution

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Environmental pollution can significantly affect ecosystems or human health. Contaminants such as heavy metals are known to significantly reduce water quality, pollute soil and agricultural products. Even more dangerous for the environment are certain organic contaminants such as PAHs, PCBs or dioxines. Since the introduction of catalytic converters in vehicles, PGE represent a new group of toxic elements with up to now unknown consequences for the environment or man.

Worldwide strongly increasing problems with environmental pollution on one side and parallely decreasing financial capacity of many of the countries of concern in asia, africa or central/south america requires the developement of new cost-effective strategies and techniques for screening and monitoring the state of the environment.

Magnetic proxies represent a new innovative way for tracing potentially polluted areas in many ecosystems. Magnetic susceptibility can be mapped already in the field and enhanced values clearly point towards contaminated soil or sediment bodies. By using certain magnetic parameters, even at least a qualitative estimation of the content of certain pollutants (heavy metals) in soils, sediments or aerosols (fly-ashes) is possible. In addition, reconstruction and tracing of potential emission sources is achieved in this way. In our contribution, magnetic screening/monitoring will be demonstrated to be a new, alternative method which does not substitute for the classical techniques (such as bio- or chemo-monitoring) but does, of course, represent a fast and inexpensive method which can significantly reduce the number of samples and therefore costs of direct geochemical analyses.