

Geochemical dataset of environmental samples from Idrija urban area, Slovenia

Geokemični podatkovni niz okoljskih vzorcev iz urbanega območja Idrije, Slovenija

Špela Bavec & Mateja Gosar

This dataset contains the results of geochemical analyses of three different urban materials – soil, sediment and household dust from the urban area of Idrija town (Slovenia). Topsoil, subsoil and garden soil were collected on the urban green surfaces. Sediments were collected in the gully pots of the urban drainage system (road sediments) and local streams flowing through Idrija's urban area (stream sediments). Household dust was collected from the vacuum cleaner bags, which were provided by the residents. The geochemical analyses carried out were: (1) multi-elemental analysis (determination of element contents after modified aqua regia digestion by inductively coupled plasma (ICP) mass spectrometry and ICP emission spectrometry (ES)) and (2) solid phase Hg thermo-desorption technique (determination of the relative amount of Hg binding forms). These two methods were applied to all investigated materials. Water leaching tests were carried out to determine the water-soluble Hg content in the urban soil by ICP-MS. A modified simulated stomach acid extraction in vitro tests were carried out to determine the bioaccessible Hg content in topsoil and household dust by ICP-MS. The dataset has a fundamental scientific value and is useful for local soil, sediment and household dust quality research, mitigation of pollution evaluation over time and assessment of environmental exposure and related health impacts.

Podatkovni niz vsebuje rezultate geokemičnih analiz treh različnih urbanih materialov – tal, sedimentov in hišnega prahu iz poseljenega območja Idrije. Na urbanih zelenih površinah so bili vzorčeni zgornji in spodnji sloj tal ter vrtna tla. Sedimenti so bili vzorčeni iz obcestnih jarkov drenažnega sistema (cestni sedimenti) in lokalnih potokov, ki tečejo skozi urbano območje Idrije (potočni sedimenti). Hišni prah je bil vzorčen iz vrečk sesalnikov, ki so jih posredovali prebivalci Idrije. Geokemične analize vključujejo (1) več-elementno analizo (določitev vsebnosti elementov po modificirani zlatotopki z induktivno sklopljeno plazmo (ICP) masno spektrometrijo (MS) in ICP emisijsko spektrometrijo (ES)) in (2) termično desorpcijsko analizo oblik vezave Hg (določitev relativne količine Hg oblik vezave). Ti dve metodi sta bili uporabljeni za vse preiskovane materiale. Izvedeni so bili vodni izluževalni testi za določitev vodotopne vsebnosti Hg v izlužkih urbanih tal z ICP-MS ter in vitro izluževalni testi z modificirano simulirano želodčno kislino za določitev biološko dostopne vsebnosti Hg v zgornjem sloju tal in hišnem prahu z ICP-MS. Podatkovni niz ima temeljno znanstveno vrednost in je uporaben za lokalne raziskave kakovosti tal, sedimentov in hišnega prahu, vrednotenje onesnaženosti skozi čas ter oceno izpostavljenosti okolju in s tem povezanih vplivov na zdravje.