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Single particle ICPMS based methods for tracking environmental leaching of nanoparticles from consumer products

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Globally industrial production of engineered nanoparticles increases dramatically, what raises concerns about their release and fate in the environment. There are numbers of methods for nanoparticle characterization and detection including TEM, DLS, NTA and many others but not one of these methods is fit for purpose regarding mainly low detection limits in ng/L range, which is environmentally relevant. During the last few years single particle ICPMS (spICPMS) technique showed a great potential for detection of gold and silver nanoparticles in the ng/L concentration levels.

Within the project SUN we are developing spICPMS method using triple quadrupole ICPMS to study potential release of metallic nanoparticles from nanoparticle based consumer products into simulated aquatic environment namely for Fe₂O₃, CuO and TiO₂ nanoparticles. In this contribution the spICPMS method is evaluated in terms of particle size detection limit for Fe, Cu and Ti based nanoparticles and spICPMS method development strategy is presented.

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