Treatment of Pharmaceutical Residues Emitted by Hospitals (PharmaTreat)

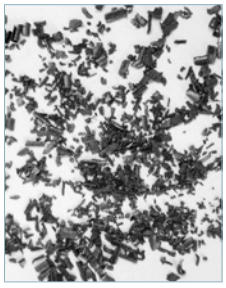
The occurrence of pharmaceuticals in the aquatic environment is a matter of significant concern. Active agents like antibiotics, cytostatic drugs and iodinated X-ray contrast media (ICM) as diagnostic compounds are emitted into the environment through the discharge of hospital urine containing high concentrations of these agents . It therefore appears obvious that the treatment of the urine on the spot can contribute to curb the aquatic pollution by the compounds mentioned.

Aim of the project

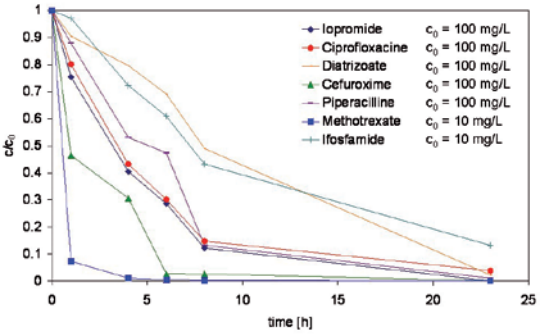
- Development of a technical process to treat hospital urine with zero-valent iron facilitating the transformation of the pharmaceuticals which, as a result, will become most probably biodegradable and thus treatable by common waste water treatment plants

Work packages

- Selection of different pharmaceuticals on the basis of the agents consumed at the hospital Charité (Berlin) and development of a LC-MS/MS method to analyse the compounds
- Experiments in pure water to evaluate the kinetic degradation data and the mechanism:
  - Influence of pH, temperature and stirring speed
  - Influence of different compounds like chloride, sulphate, phosphate and urea being the main constituents of human urine
  - Bacterial toxicity and biodegradation tests before and after the treatment with zero-valent iron
- Experiments with urine under optimised conditions and tests related to the multiple use of iron



Granular iron splints (size: 0.3 – 3 mm, surface area: 0.5 m2/g)



Percentage decrease of different pharmaceuticals in treated urine (constant pH 3, temperature 25 °C)

Duration: 04/2007–03/2010	Project volume: 418,015 EUR

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