Objectives and activities - Stage II-2018

O_1. Develop batch adsorption/desorption procedures for heavy metal ion removal;

1.1. Batch adsorption studies using simulated waste water containing heavy metal ions;

1.2. Studies regarding desorption/regeneration process after heavy metal ion adsorption

O2. Develop batch adsorption/desorption procedures for dye removal;

2.1. Batch adsorption studies using simulated waste water containing anionic dyes;

2.2. Studies regarding desorption/regeneration process after dye adsorption;

2.3. Test treatment procedure on a real waste water sample.

Results and conclusions

- The composite synthesized in by the pilot scale optimized procedure, with a saturation magnetization higher than 20 emu/g and a volume average diameter in the range of 270-300 µm has been tested as an adsorbent for heavy metal ions and anionic dyes. Its physical properties ensure fast magnetically aided separation from the liquid phase, thus eliminating time and energy consuming processes, such as sedimentation or filtration.
- The parameters for the adsorption processes of Cu(II) ions and anionic dyes RB19 and RO16 have been optimized. The pollutant adsorption capacities (285,7mg Cu(II)/g; 935,46 mg RB19/g; 1409,79mg RO16/g) are superior compared to those of similar materials described in the literature. The data show that the adsorption processes are fast and spontaneous.
- Pollutant desorption processes have been developed. The adsorbent re-use ability has been demonstrated.
- The composite material synthesized in pilot scale has been tested for decontaminating real waste water samples collected from cotton dyeing. Dye removal rates of 98-100% have been demonstrated.