

Phosphorus Recovery from a Water Reservoir–Potential of Nanofiltration Coupled to Electrodialytic Process - DTU Orbit (12/08/2016)

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Worldwide waste streams can represent an environmental problem if they are considered “deleterious material”. These streams may also be a source of secondary resources when enclosing compounds with potential to be recovered. Phosphorus (P) is one of those, with an increasing interest, as it is essential for life but its non-renewable reserves are expected to last about one century. Nanofiltration (NF) and electrodialytic process (ED) were applied to a stream from a Water Treatment Plant (WTP). Water from Funcho Dam Reservoir, Portugal, was subject of NF treatment followed by ED process for P recovery. The feed concentration of P for ED process was between 1,429 and 1,845 µg/L. Optimization studies were carried out in laboratory cells. Almost complete P removal out of the central compartment of the ED cell was observed under the action of an applied electric field. Experiments lasted between ca. 7 and 42 h experimental-period, depending on concentrate parameters. In less than 7 h of ED, 72 % of P was recovered in the anolyte and thereby separated from the concentrate stream. Nanofiltration coupled to ED can be considered a promising and sustainable technology to upgrade waste streams, recovering P and avoiding the intensive mining of phosphate rock.

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