

PERFLUOR-AD: NEW BIOSORBENTS FOR THE PURIFICATION OF AQUEOUS MEDIA CONTAMINATED WITH PFC

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ISSUE

Because of their unique technological properties **fully fluorinated surfactant compounds (PFC)** are utilized as a very efficient processing aid especially in the sector of electroplating industries and for fire fighting foams. On the other hand the use of these products is harshly restricted since June 27, 2008. They belong to the group of p^3 (polar persistent pollutants) and some of them have a toxic effect on people and environment.

PURPOSE

Our research activities aim at the development of new bio-based adsorption materials which allow a simple and economical removal of PFC from aq. media. These new materials are not supposed to be re-processed but taken to thermal disposal to decompose the pollutants at the corresponding temperature and as well to win thermal energy.

APPROACH

Our main sources are renewable, cellulose-based raw materials, such as wood, hemp stalks, coffee grounds and others. Preferably porous waste products are utilized. These substances are chemically modified by cationization processes to adjust interaction of the substrate and pollutant. Depending on the cationization reagents, different pollutants with corresponding characteristics can be adsorbed. Here, both electrostatic and hydrophobic interactions are relevant. Up-scaling for a large scale production and its implementation are in progress. Furthermore we could improve the results by combining the adsorption with a flocculation process. The flocculation of dispersed powder adsorbents shortens the sedimentation time, simplifies the filtration of the charged adsorbent and even increases the amount of the adsorbed PFC.

Flocc. Aid	Slurry	Sediment. Time [min]	Filtration Time [min]	Remaining Turbidity [%]	Release [%]
Praestol A3040L	Bead Cellulose	>1	2:05	88	44
	QuabPC_342	>1	1:48	36	3

IN COOPERATION WITH

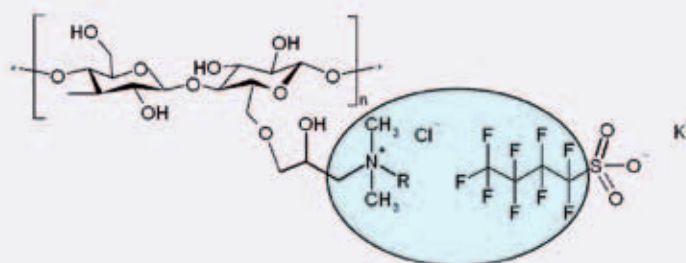


Fig. 1: Modified cellulose molecule interacts with PFBS molecule

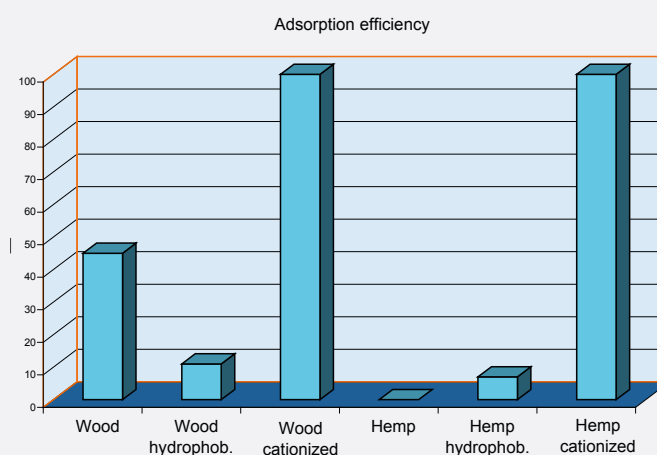


Fig. 2: Comparison between the efficiencies of different adsorbents



Fig. 3: Dispersion of powder to be flocculated by an add-on of poly-electrolytes