Research on pretreatment of highly concentrated dye-printing wastewater using surplus sludge together with powder ash

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The pretreatment craft is extremely essential in the processing of dye-printing waste water. Using surplus sludge together with the powder ash as the flocculants to pretreat highly concentrated dye-printing wastewater, which leads to the remarkable reduction of the discharge monitoring index in the wastewater — chroma, the suspended solid and the chemical oxygen demand.[1]

This article has conducted the experimental study uses surplus sludge together with the powder ash as the flocculants to pretreatment highly concentrated dye-printing waste water. The results show that through control the volume ratio of the surplus sludge and coal ash, static time and so on, when the volume ratio is the dye-printing waste water/Surplus sludge/coal ash =60: 1: 8, and the static time between 20 ~ 40 minutes, there is a remarkable reduction of the discharge monitoring index in the waste water–chroma and the chemical oxygen demand. The finding provides the experiment basis for reducing the consequent biochemical treatment loads effectively reducing the running cost for highly concentrated dye-printing waste water disposal exploring the industrialized technical designing direction and the way on using the waste to deal with the waste.

[1] Zheng Z, Xu J , Sun Y Y, *et al*. Synthesis and chiroptical properties of optically active polymer liquid crystals containing azobenzene chromophores [J]. *Poly Science*, 2006, **44** (10) : 3210- 3219.

Mass-dependent fractionation and mass-independent fractionation of Hg isotopes in aqueous environment

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Preliminary studies have demonstrated both mass-dependent fractionation (MDF) and mass-independent fractionation (MIF) of Hg isotopes in the environment (1) and the potential for their application in biochemistry and geochemistry. However, the majority of previous work has focused either on developing reliable MC-ICP-MS measurements or on monitoring isotopic variation of Hg in solid samples and in Hg-enriched synthetic solutions. Little has been reported for Hg isotope geochemistry in natural aqueous environment because of the very low Hg concentrations (several ng/L).

Precipitation samples and water samples from different aquatic systems (remote lakes, contaminated rivers, groundwater) were analyzed for Hg isotopic composition after pre-concentration using a new pre-concentration method (2). The results displayed evident MDF and MIF of Hg isotopes in natural aqueous environment. All samples displayed a total δ^{202}Hg variation of 2.42‰ (-1.68‰ to 0.74‰), with lower values for precipitation and lake waters and higher values for contaminated river waters. Unlike waters from contaminated rivers, precipitation samples displayed positive MIF of odd Hg isotopes, contrast to the predicted result from previous studies. Moreover, our results confirmed the observation of MIF of odd Hg isotopes (^{200}Hg) in precipitation samples (3), implying that the (atmospheric) process introducing the MIF for even Hg isotopes may be different from that producing MIF of odd isotopes in the aqueous environment. More research is required to fully understand the behavior of Hg isotopes in the hydrosphere.

[1] Bergquist, B. *Sci*. 2007; [2] Chen J-B. *JAAS,* 2010**;** [3] Gratz, L. *EST* 2010.