

## Color remediation of chemimechanical pulping effluent using combination of enzymatic treatment and Fenton reaction

### ABSTRACT

This research investigated the efficiency of Advanced Oxidation Processes, Enzymatic treatment, and combined enzymatic/AOPs sequences on color remediation of CMP pulp and paper mills effluent. Regarding enzymatic treatment two kinds of fungal enzymes; Laccase (EC: 1.10.3.2) from *Terametes Versicolor* and Versatile Peroxidase (EC: 1.11.1.7) from *Bjerkandera adusta* were chosen and applied. Also, the effect of external mediator on the enzyme based degradations was studied. It was found that both VP from *Bjerkandera adusta* and Laccase from *Terametes versicolor* decolorized the deep brown effluent to a clear light yellow solution. It has been found that, concomitant use of enzymes and photo-Fenton process produces a considerable effect on color remediation. The data analysis of sequence treatment indicated that, chemical treatment after the enzymatic stage (photo-Fenton as a post treatment unit) yield a better performance for the CMP effluent.

**Keyword:** CMP pulp; Advanced Oxidation Processes (AOPs); Fenton; Enzymatic treatment; Versatile Peroxidase; Laccase