**Hybrid method development for the removal of Crystal violet dye from aqueous medium**

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**Abstract**

Water scarcity is the much identified issue all over the world. For sustainable future, the available sources of water need to be reused. Therefore, in this work dye industry effluent was treated using combinative photo catalysis and ceramic nano-filtration membrane. Commercial ceramic membrane and TiO2 catalyst were used to investigate the removal of crystal violet dye from the aqueous solution. The effect of operating parameters such as inlet pressure, initial concentration of crystal violet dye, catalyst (TiO2) loading, initial pH were investigated in the individual system and the combined system. The results of this study revealed that at pH-9.0 and 0.75 g/l of TiO­2 concentrations: 95 % of dye effluent (500ppm) was decolorized and 89 % of TOC was removed by the hybrid system. While individual system decolorized 54 % of dye and 42 % of TOC. The operation of the integrated photo catalytic reactor and ceramic membrane ﬁltration has shown the maximum removal of crystal violet dye compared to individual systems. Therefore, this study showed that the hybrid method is effective for removing Crystal violet from effluents. Hence this proposed method may be effective for the removal of Crystal violet dye from effluents.

**Keywords:**

Photo catalysis, Ceramic nano-porous membrane, Dye Decolorization, Advanced Oxidation Process (AOP)