

# A heterogeneous Fenton-like system for textile wastewater treatment utilizing sunlight

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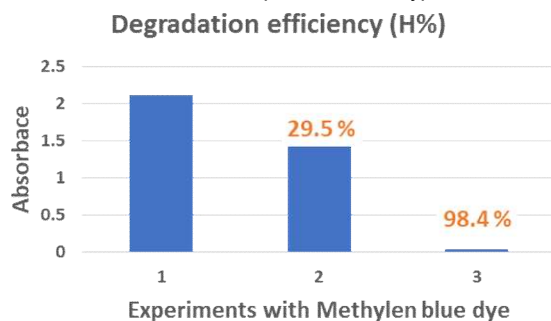
## Introduction

"Green" MOF-based photocatalyst (Fe(BDC)(H<sub>2</sub>O)) was synthesized from waste polyethylene terephthalate (PET) bottles in a "mild" condition: aqueous solution and at room temperature. Using poly(vinyl alcohol) (PVA) crosslinked with formaldehyde as matrix, sodium hydrogen carbonate as the foaming agent, powder activated carbon (AC) as adsorptive constituent and Fe(BDC)(H<sub>2</sub>O) as photocatalyst, porous PVA/AC-Fe(BDC) composite was prepared by means of chemical crosslinking method.



## Results and Discussion

The adsorption behavior and catalytic activity of the porous PVA/AC-Fe(BDC) composite was studied for methylene blue dye degradation and textile wastewater treatment. It was found that the composite acts as a heterogeneous Fenton-like system. The experiment in the dark indicates that dye sorption is about 29,5%. The adsorption and catalytic degradation efficiency is achieved 98.4% after 90 min under sunlight irradiation. On the other hand, experiments with the textile wastewater, which was collected at Van Phuc Silk Village, Ha Dong, Ha Noi, revealed that the treated water was accepted as the B-type domestic wastewater according to Vietnam Criteria (QCVN 13:2015/BTNMT).



**Table 1.** Experiments with the textile wastewater collected at Van Phuc Silk Village, Ha Dong, Ha Noi

No.	Parameter	Unit	Results			H (%)	Vietnam Acceptance Criteria 13:2015/BTNMT	
			M <sub>00</sub>	M <sub>01</sub>	M <sub>02</sub>		A	B
1	pH	-	8,8	6,0	6,0	-	6-9	5,5-9
2	Color	Pt-Co	1118,3	442,7	55,8	95,0	50	150
3	COD	mgO <sub>2</sub> /L	717,2	332,9	105,2	85,3	75	150
4	TSS	mg/L	112	104	41	63,4	50	100

M<sub>00</sub>: Initial sample; M<sub>01</sub>: treatment with the composite; M<sub>02</sub>: treatment with the composite after coagulation



**Figure 1.** Solution for textile wastewater treatment by the porous PVA/AC-Fe(BDC) composite utilizing sunlight

## Conclusion

The application of the PVA/AC-Fe(BDC) composite for environmental issues is highly potential including the recycling of waste PET and the textile wastewater treatment.

### REFERENCES

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