

8.1 Comparison of the Performances of VOCs tested against various Modified Media

In the present study, the performance of modified media (PVA/Compost /KNO₃ Composite beads, PVA/Wood charcoal /KNO₃ Composite beads and PVA/ (Compost +wood charcoal)/KNO₃ Composite beads) were tested against MTX, BTX and styrene laden air stream supplied to the biofilter column by changing the inlet concentration of pollutants for a prescribed period. Table 8.1 gives a comparative summary of the performances.

Table 8.1: VOCs tested against various modified media and their respective performances.

Biofilter media	Target VOCs	Total Operation Days	Result	Comparison and Remark
PVA/Compost/ KNO ₃ composite beads	Benzene, Toluene and Xylene	57	The maximum removal efficiency of 96.80, 97.50 and 94.5% was achieved on the 29 th day of operation for benzene and toluene and on 27 th day of operation for xylene at the loading rate of 248.1 g m ⁻³ h ⁻¹ , 201.6 g m ⁻³ h ⁻¹ , 139.4 g m ⁻³ h ⁻¹ respectively.	For Toluene and Xylene biodegradation Wood charcoal modified media shown better bio filtration performance as compared to compost modified media because maximum R.E was achieved in less no. of operation days for lower inlet loading rate in case of wood charcoal modified media.
PVA/ Wood charcoal/KNO ₃ composite beads	Methyl ethyl ketone, Toluene and Xylene	56	The maximum removal efficiencies of 96.35, 97.87 and 95.2% respectively were achieved on the 18 th day of operation for each component at the loading rate of 78.7 g m ⁻³ h ⁻¹ , 103.4 g m ⁻³ h ⁻¹ , 81.3 g m ⁻³ h ⁻¹ respectively.	
PVA/ Compost+Wood charcoal/KN O ₃ composite beads	Styrene	131	The maximum removal efficiency of 97.3 % was achieved at the loading rate of 522.5 g m ³ h ⁻¹ on the 61 th day of operation.	Compost modified biofilter media has shown better performance compared to compost+wood charcoal modified media because maximum R.E was achieved

PVA/ Compost/KNO ₃ composite beads	Styrene	123	The maximum removal efficiency of 98.2% was achieved at a loading rate of 520.2 g m ³ h ⁻¹ on 81 th operation days.	for lower inlet loading rate in case of compost modified media but with more nos. of operating days.
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