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Supporting Information

Degradation of gaseous unsymmetrical dimethylhydrazine by vacuum ultraviolet coupled with MnO_2

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Table S1 Main identified organic intermediates in VUV photolysis process at air and N_2 atmosphere under RH=0 and 50%

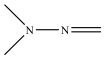
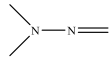
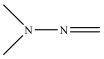
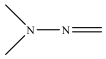
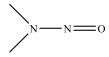
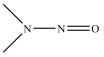
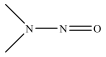
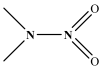
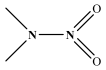
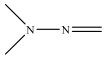
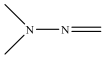
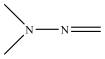
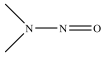
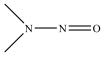
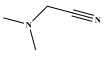
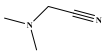
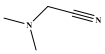
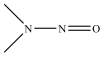
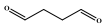
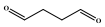
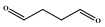
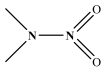
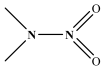
Rank by intensity	N_2+VUV				Air+VUV			
	RH=0%		RH=50%		RH=0%		RH=50%	
	Possible Compound	Corresponding Structure	Possible Compound	Corresponding Structure	Possible Compound	Corresponding Structure	Possible Compound	Corresponding Structure
1	Formaldehyde dimethylhydrazone		Formaldehyde dimethylhydrazone		Formaldehyde dimethylhydrazone		Formaldehyde dimethylhydrazone	
2	Dimethylamine		N-nitroso dimethylamine		N-nitroso dimethylamine		N-nitroso dimethylamine	
3			Dimethylamine		Dimethylamine		Dimethylamine	
4					N-methylformamide		N-methylformamide	
5					Dimethylnitramine		Dimethylnitramine	

Table S2 Main identified organic intermediates in VUV/MnO_2 process at air under RH= 50%

Rank by intensity	VUV/MnO_2					
	α-MnO_2		β-MnO_2		δ-MnO_2	
	Possible Compound	Corresponding Structure	Possible Compound	Corresponding Structure	Possible Compound	Corresponding Structure
1	Formaldehyde dimethylhydrazone		Formaldehyde dimethylhydrazone		Formaldehyde dimethylhydrazone	
2	N-nitroso dimethylamine		N-nitroso dimethylamine		Dimethylaminoacetonitrile	
3	Dimethylaminoacetonitrile		Dimethylaminoacetonitrile		N-nitroso dimethylamine	
4	Succinaldehyde		Succinaldehyde		Succinaldehyde	
5	N-methylformamide		1,3-oxazolidine		1,3-oxazolidine	
6	Dimethylamine		N-methylformamide		N-methylformamide	
7	1,3-oxazolidine		Dimethylamine		Dimethylamine	
8	Dimethylnitramine		Dimethylnitramine		Dimethylnitramine