Electronic Supplementary Information

The Reactivity of Quaternary Ammonium- *versus* Potassium-Fluorides Supported on Metal Oxides: Paving the Way to an Instantaneous Detoxification of Chemical Warfare Agents

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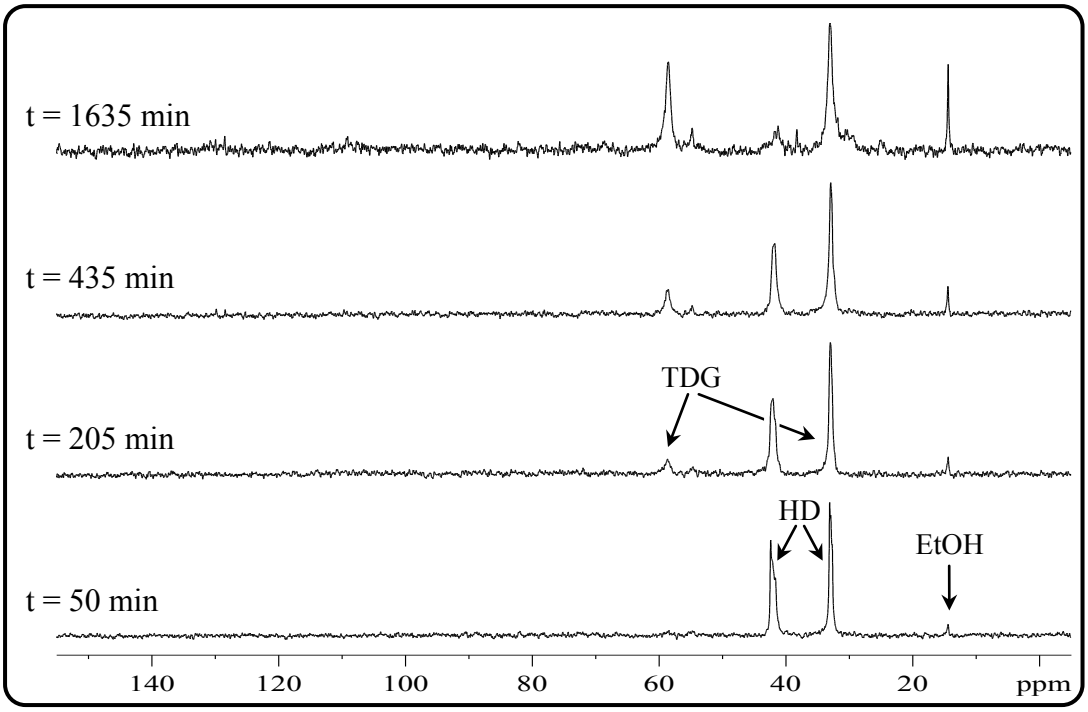


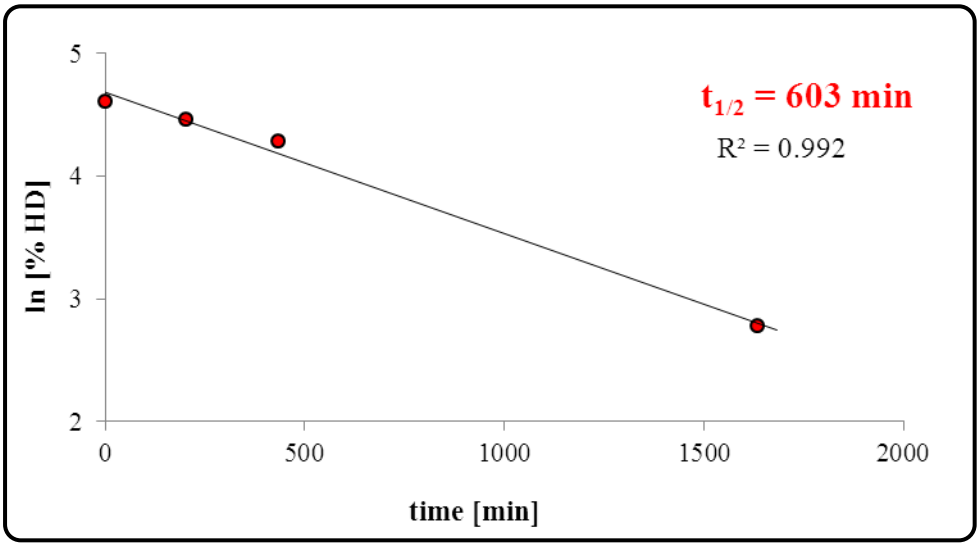
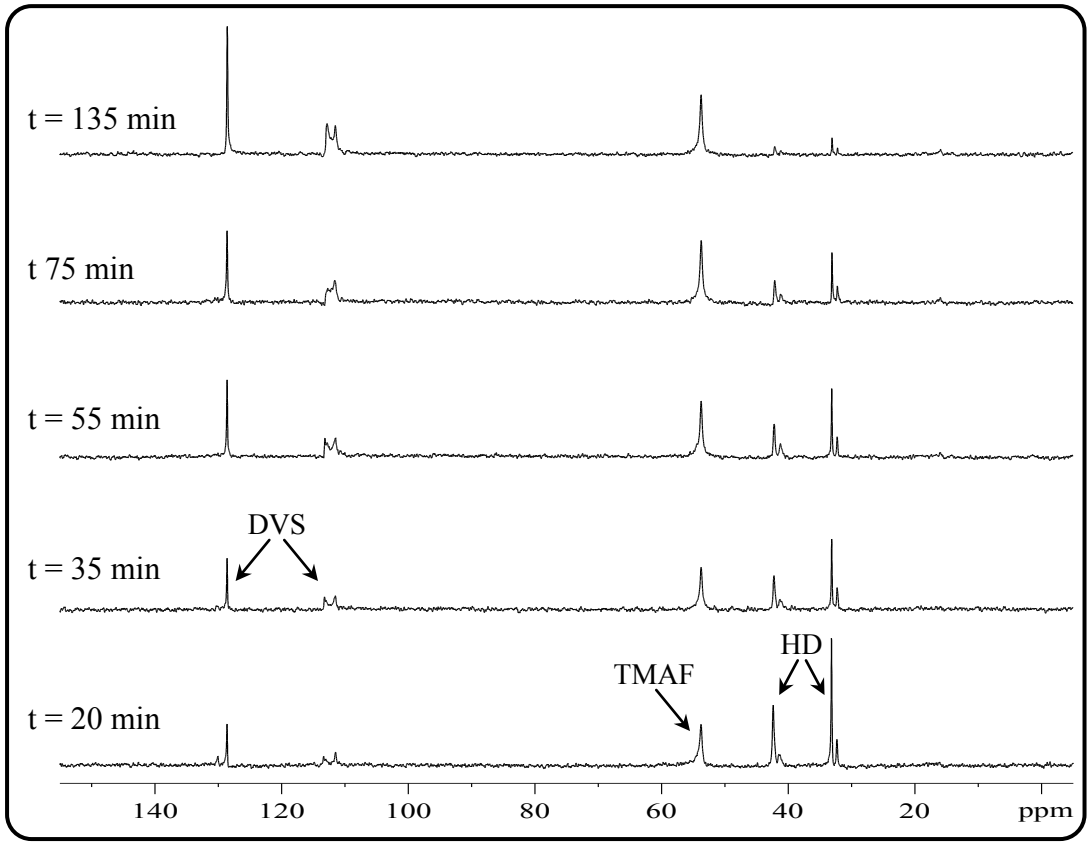


Fig. S2: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on KF/Al_2O_3 (6, EtOH, 60), containing 1 mmol KF, and its degradation profile onto this sorbent.



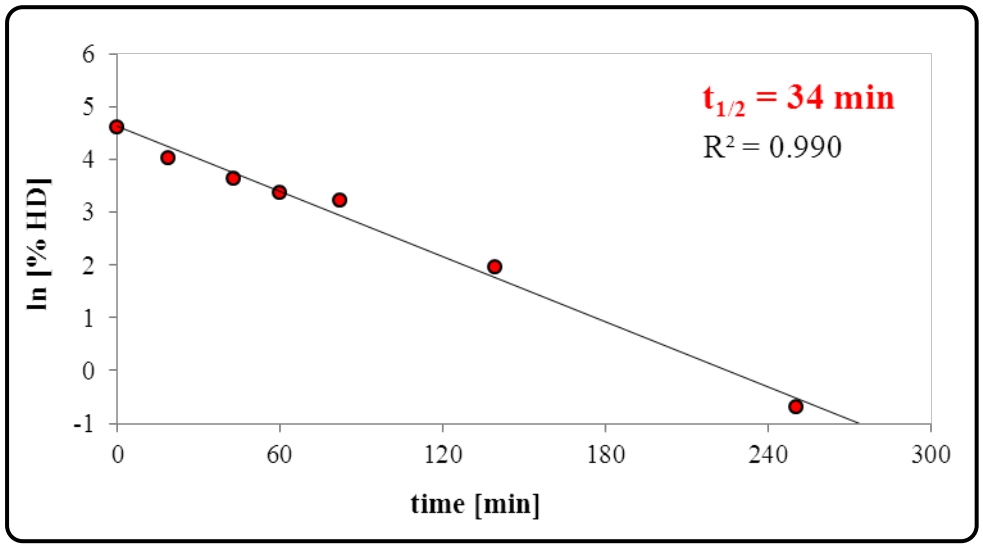
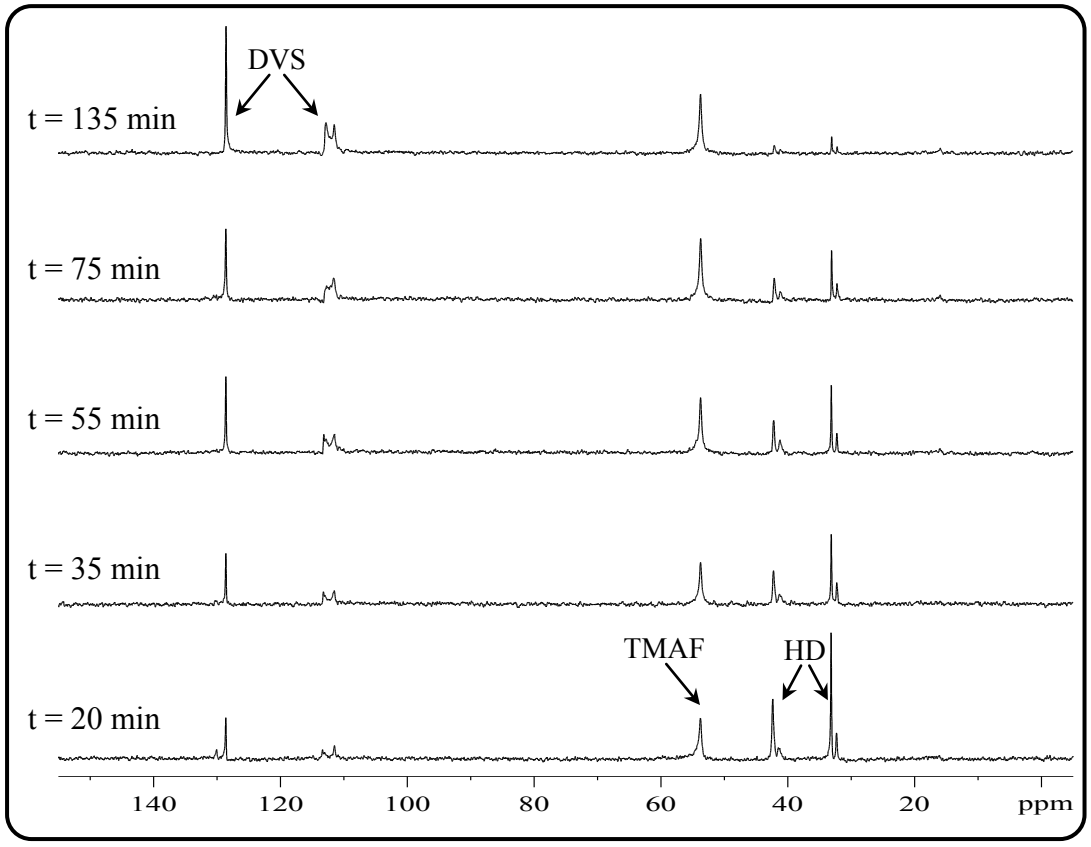


Fig. S3: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on TMAF/Al_2O_3 (16, EtOH, 60), containing 1 mmol TMAF, and its degradation profile onto this sorbent.



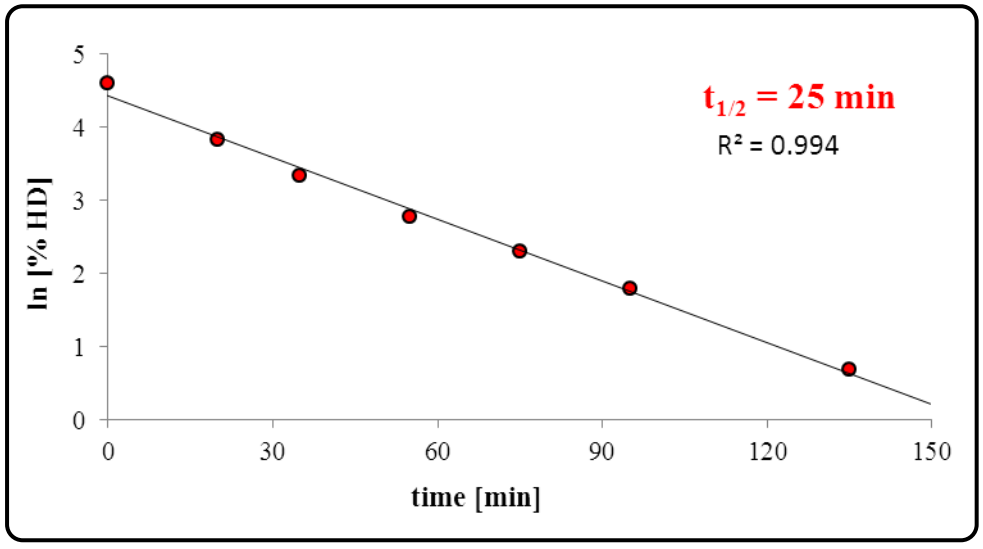
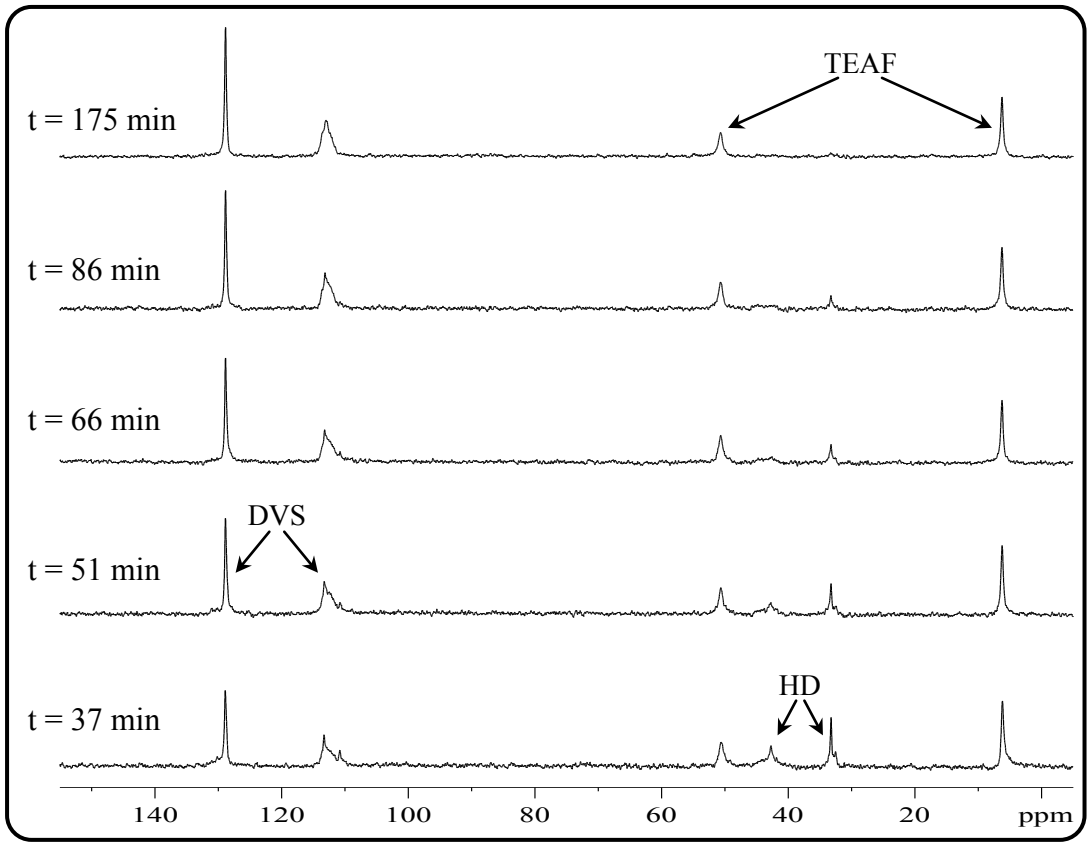


Fig. S4: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on TMAF/Al_2O_3 (33, EtOH, 60), containing 2 mmol TMAF, and its degradation profile onto this sorbent.



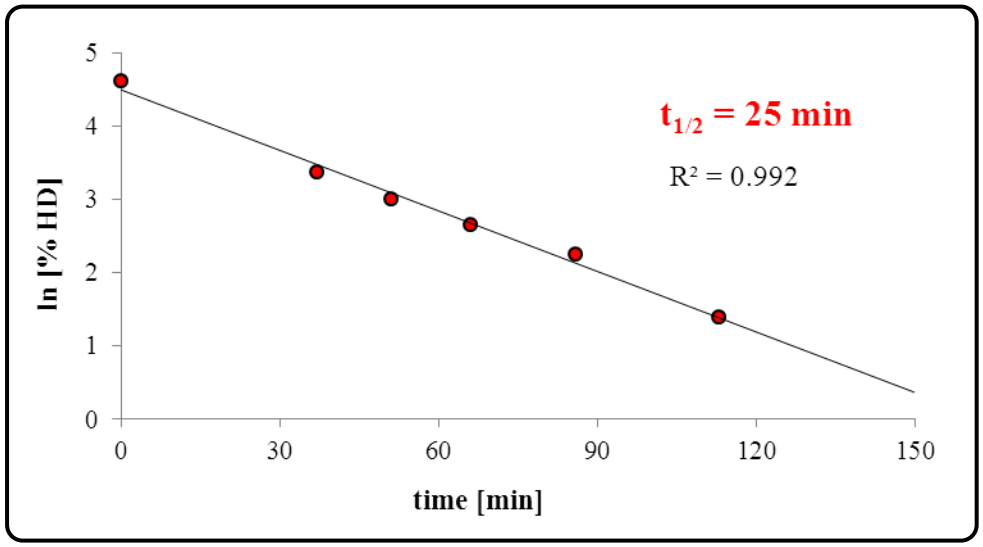
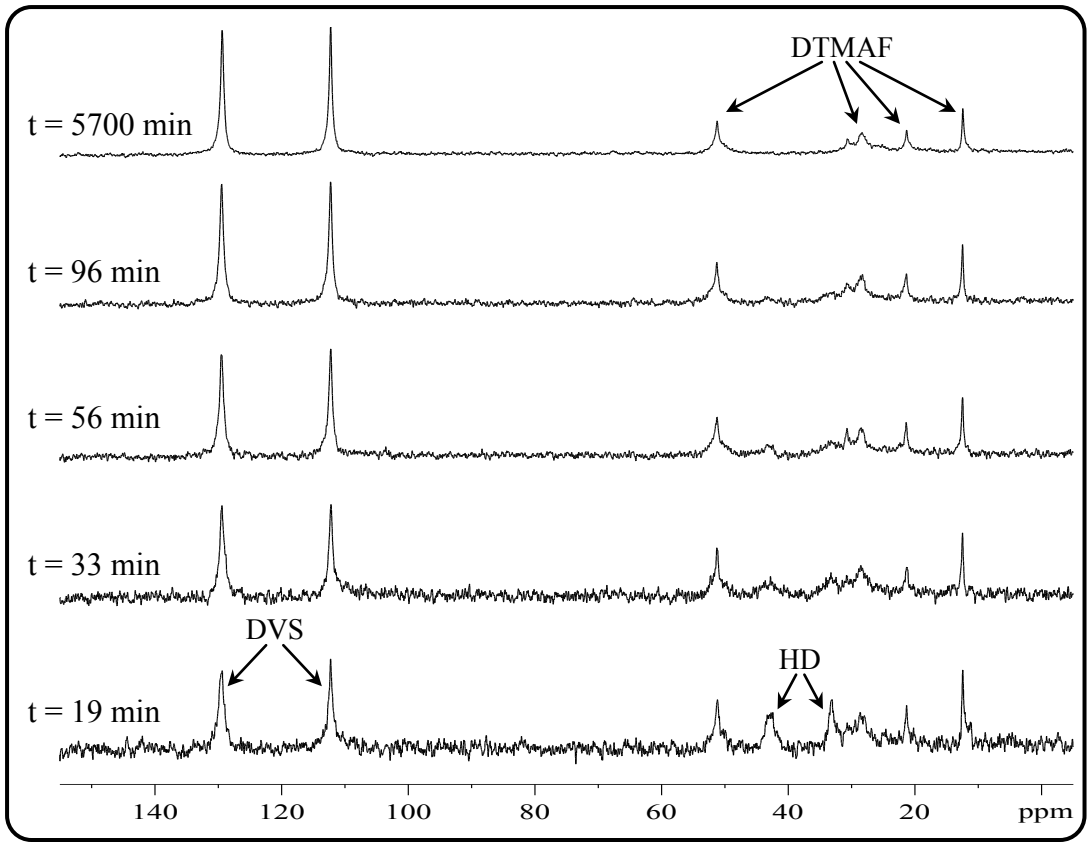


Fig. S5: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on TEAF/Al_2O_3 (18, EtOH, 60), containing 1 mmol TEAF, and its degradation profile onto this sorbent.



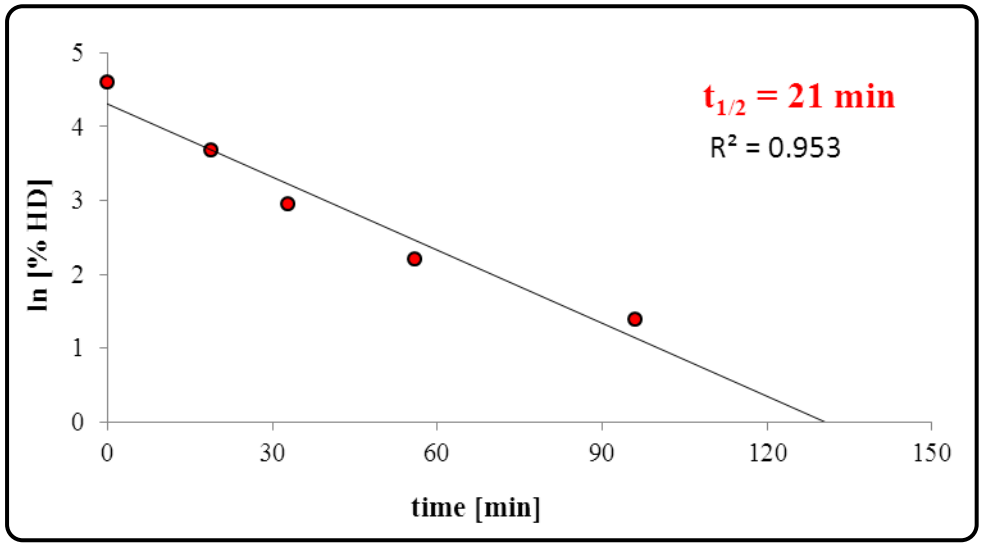


Fig. S6: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on DTMAF/Al_2O_3 (27, EtOH, 60), containing 1 mmol DTMAF, and its degradation profile onto this sorbent.

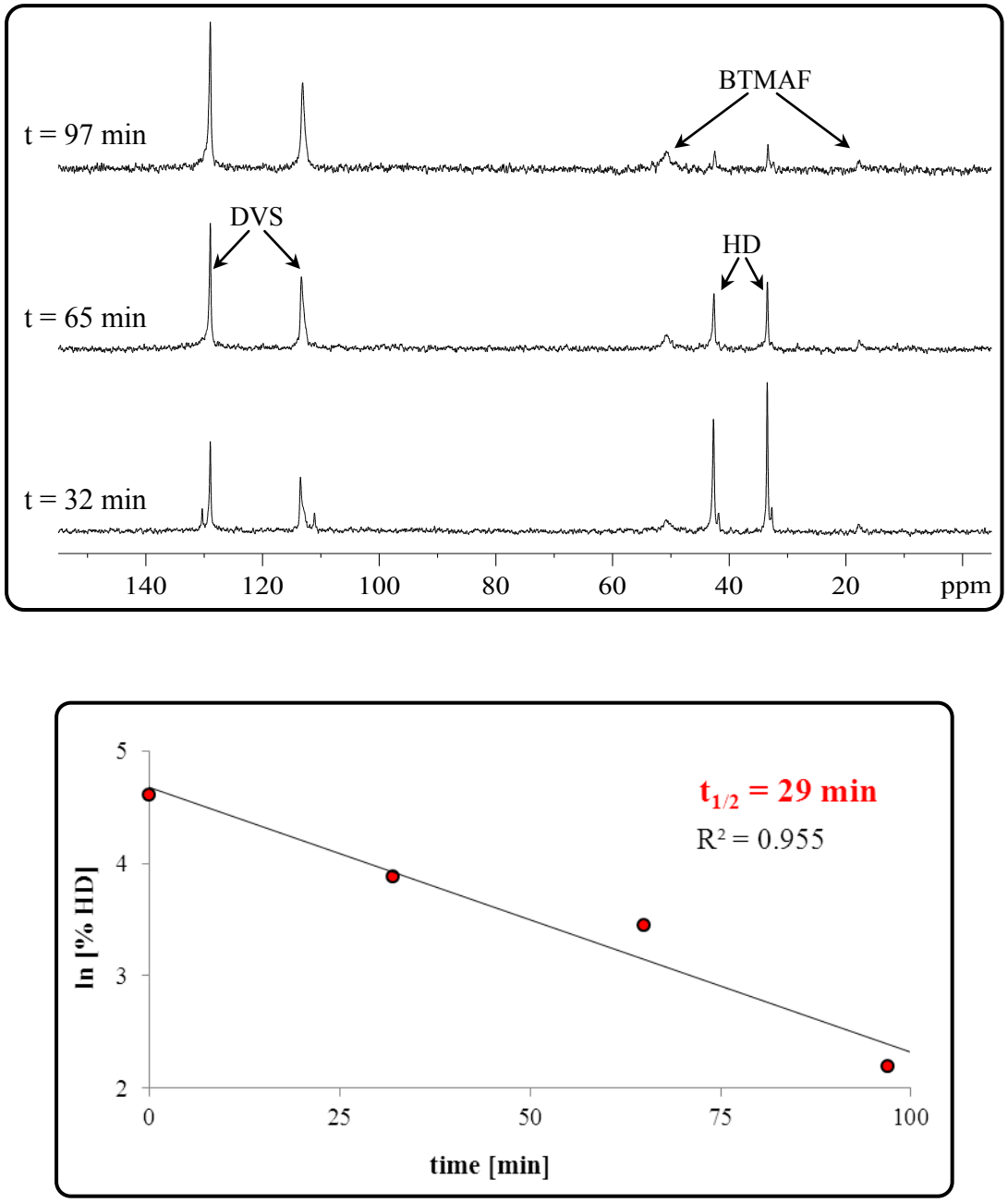
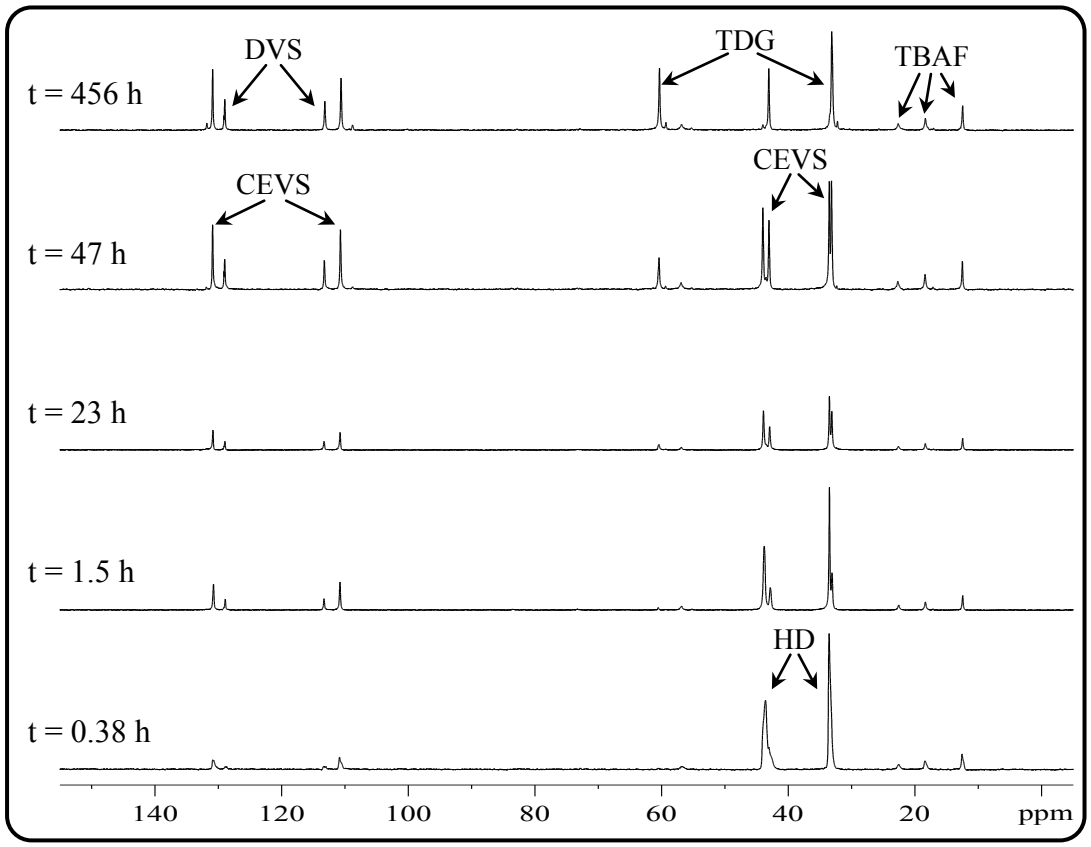


Fig. S7: ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on BTMAF/Al_2O_3 (20, EtOH, 60), containing 1 mmol TAAF, and its degradation profile onto this sorbent.



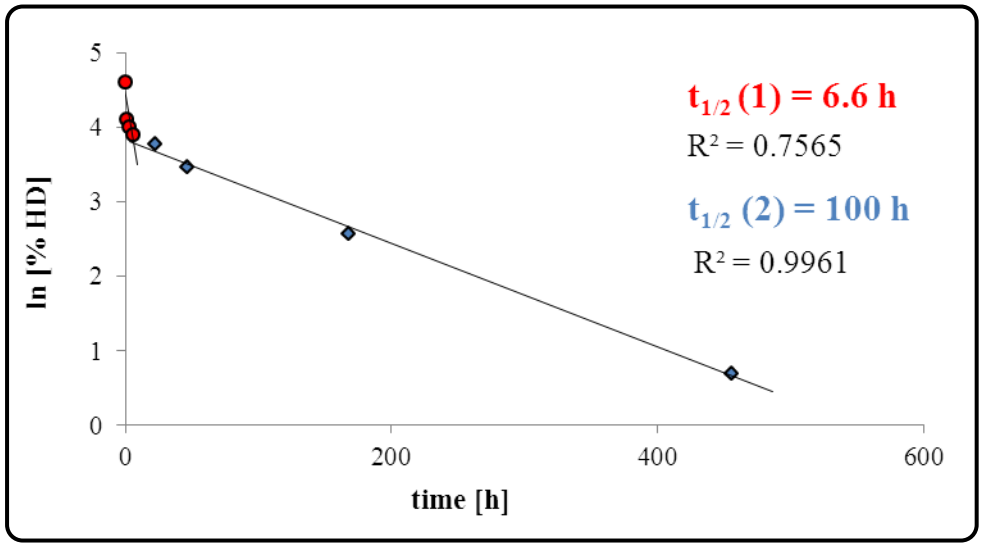
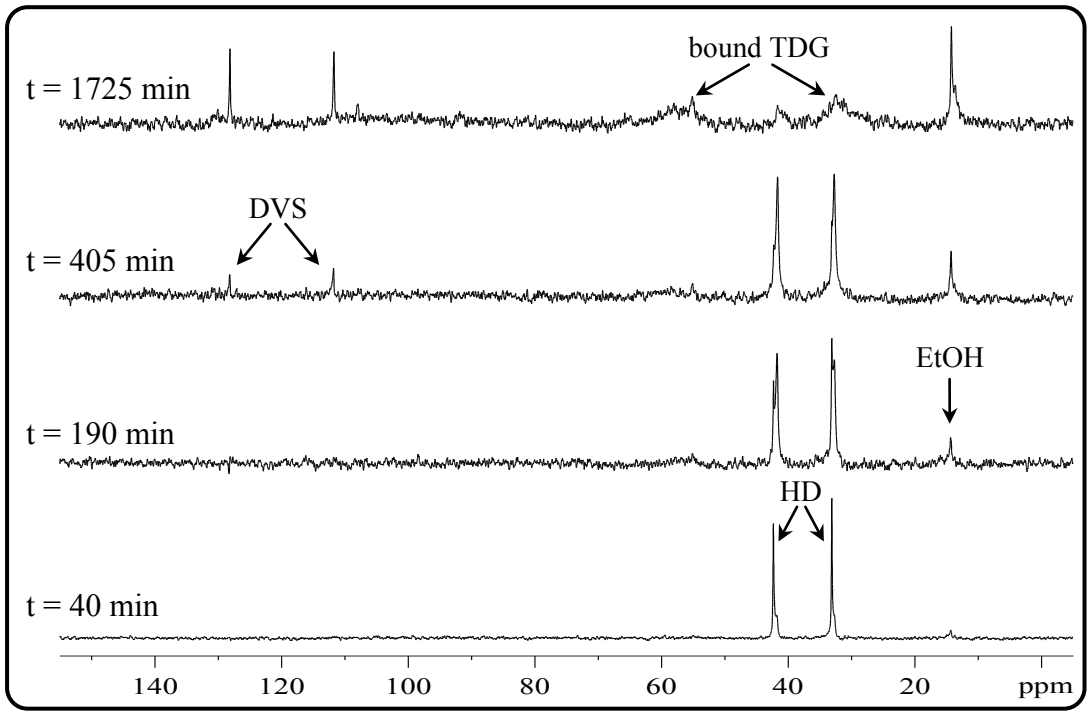


Fig. S8: Selected ^{13}C MAS NMR spectra of adsorbed HD* (5% wt) on TBAF/Al_2O_3 (20, EtOH, 60) and its degradation profile onto this sorbent.



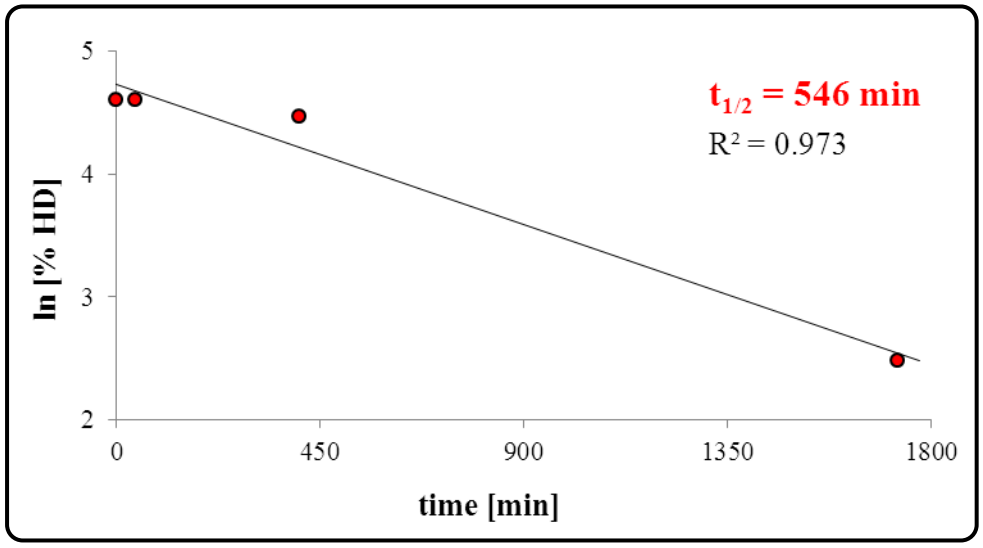


Fig. S9: ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on KF/SiO_2 (12, EtOH, 60), containing 2 mmol KF, and its degradation profile onto this sorbent.

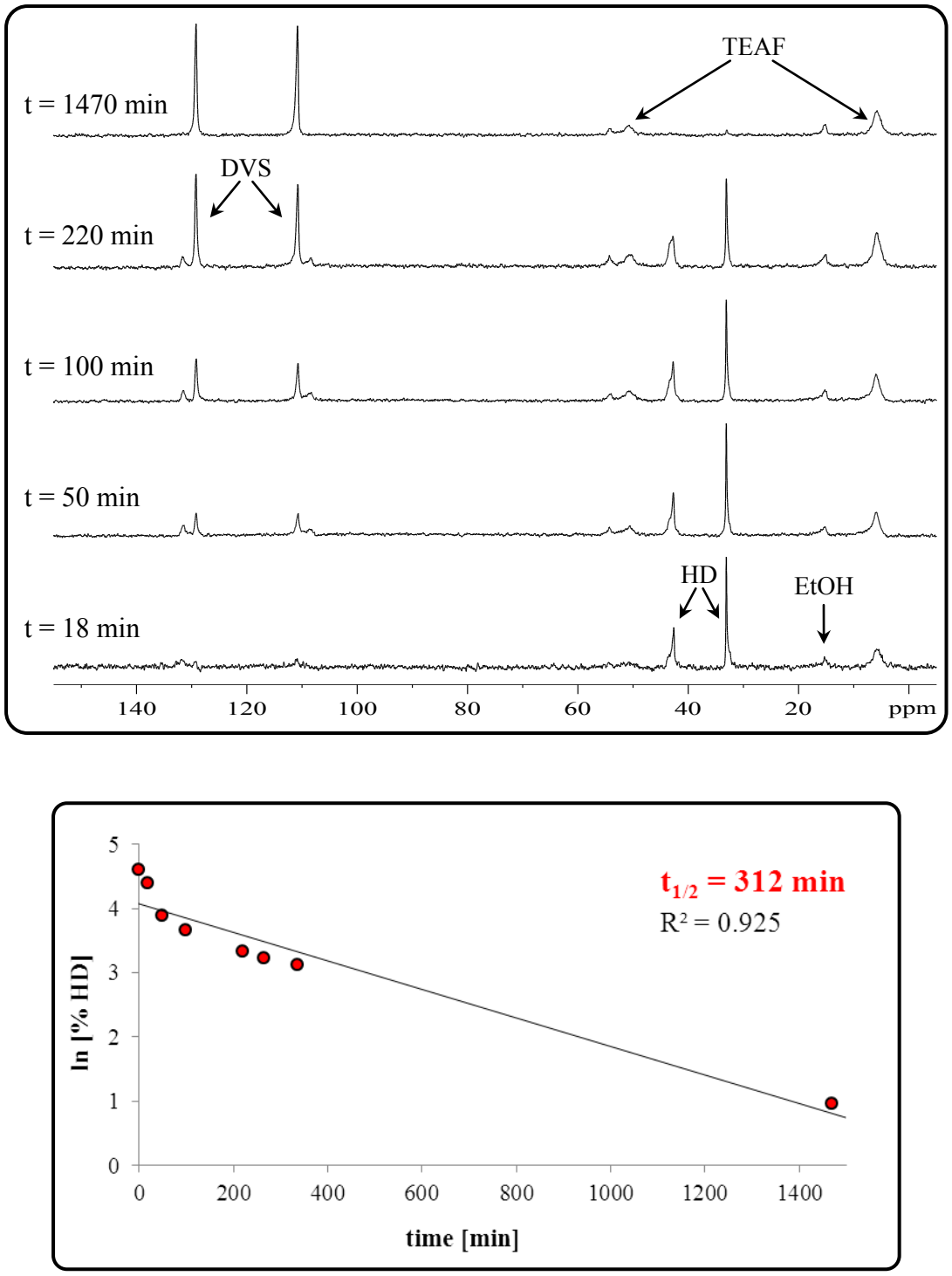


Fig. S10: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on TEAF/SiO_2 (18, EtOH, 60), containing 1 mmol TEAF, and its degradation profile onto this sorbent.

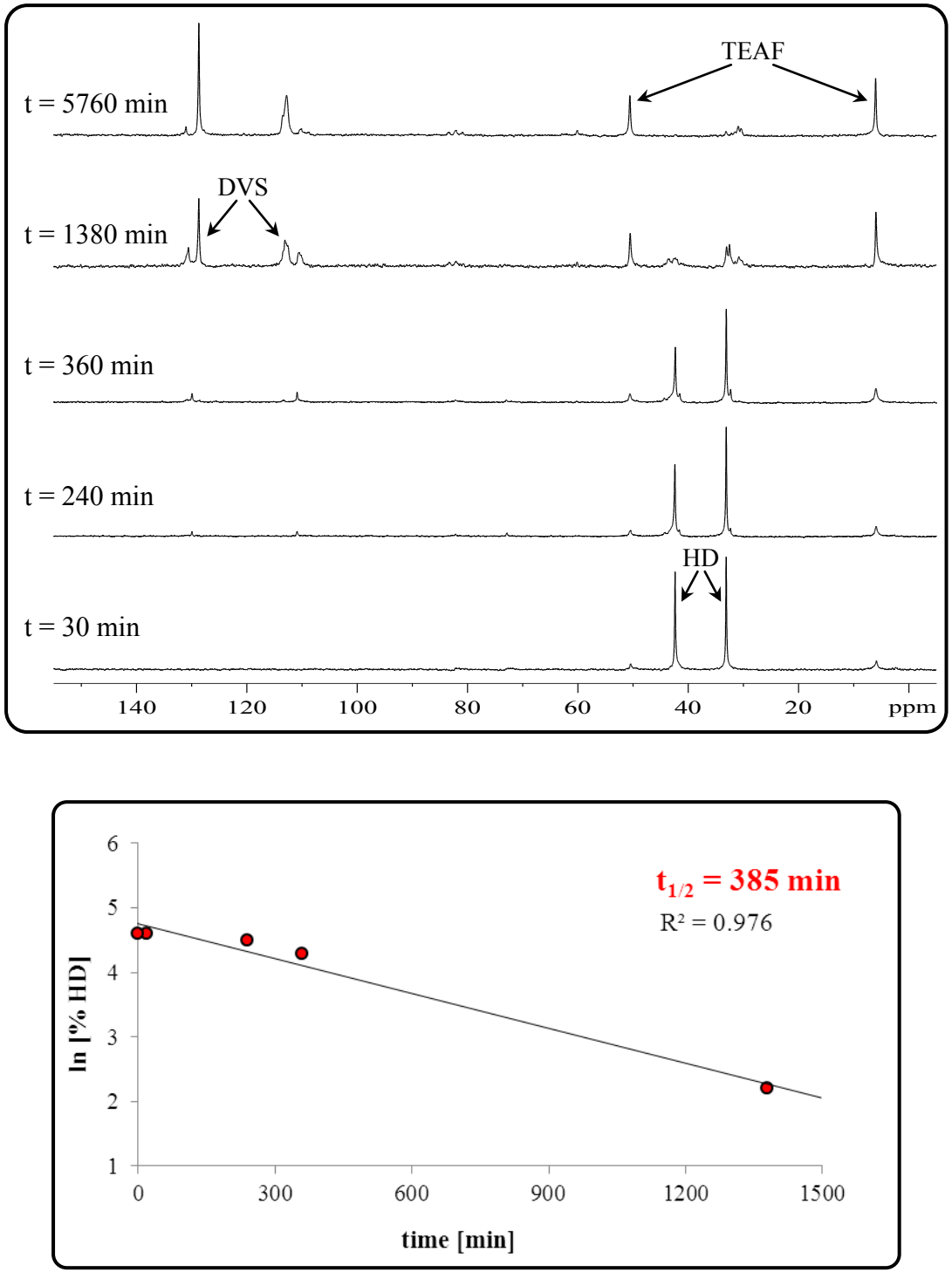
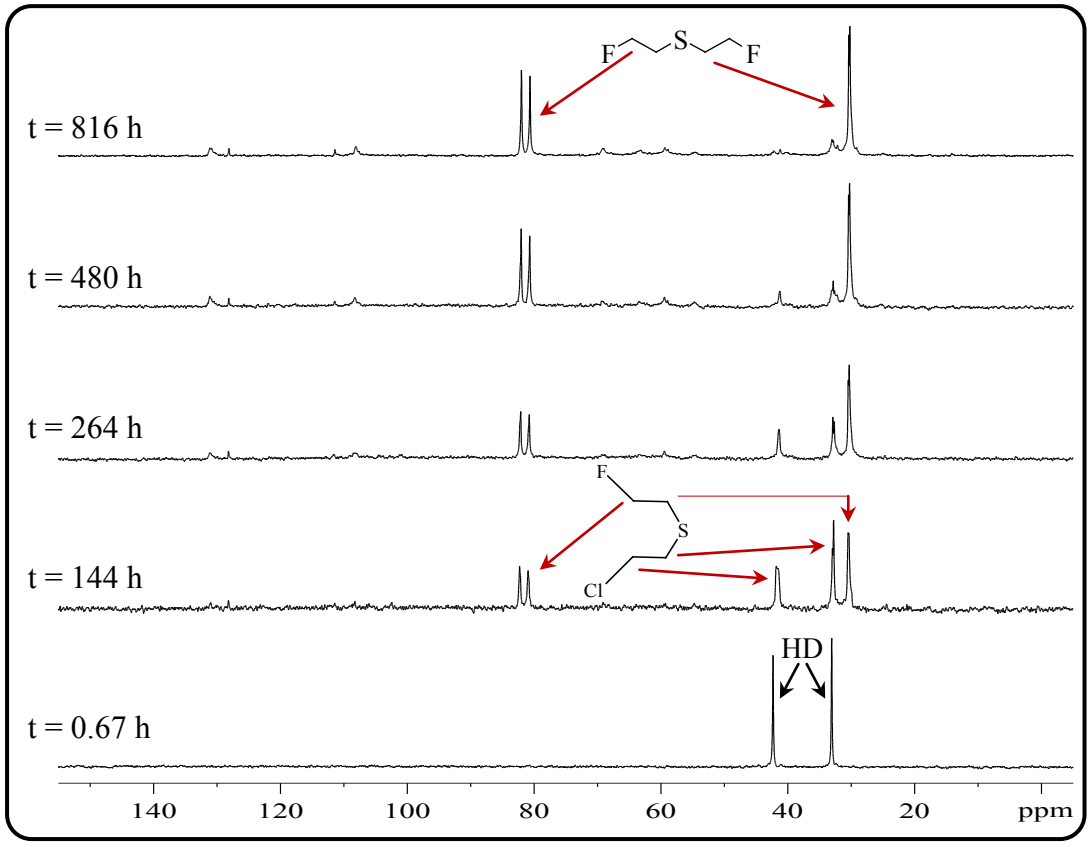
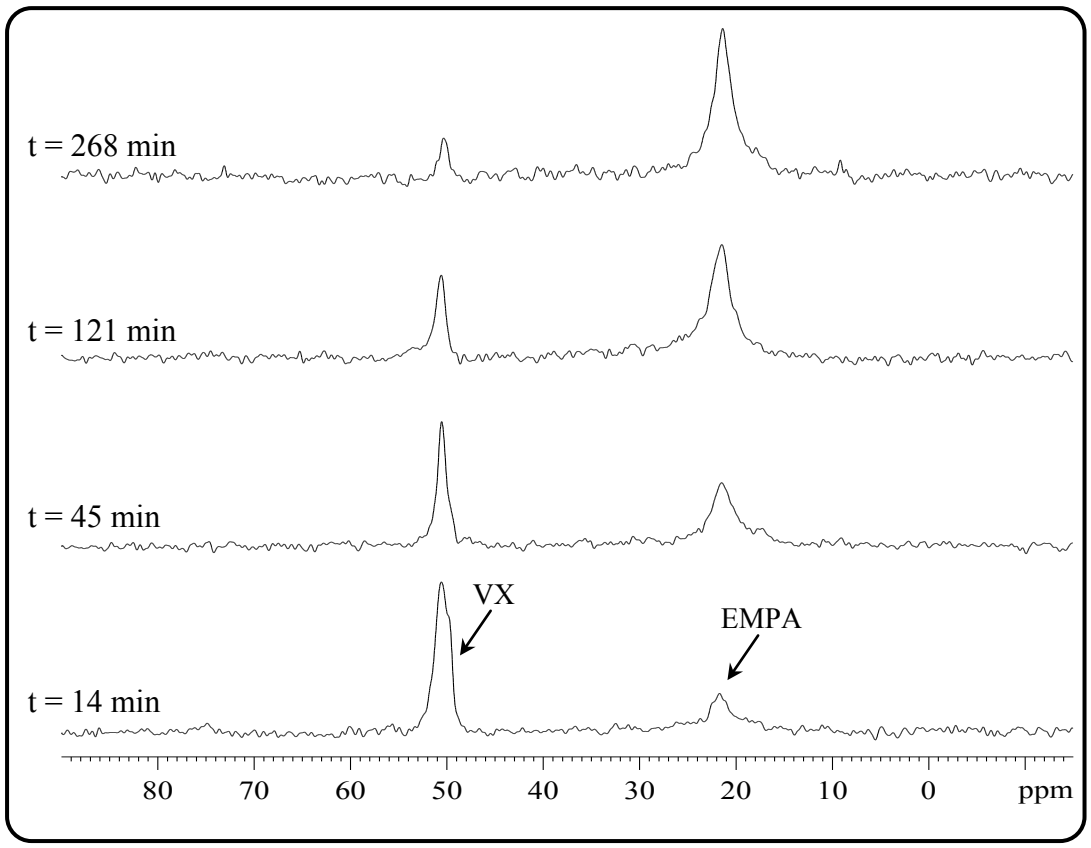


Fig. S11: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on TEAF/TiO_2 (18, EtOH, 60), containing 1 mmol TEAF, and its degradation profile onto this sorbent.



$t_{1/2}$ > 24 h

Fig. S12: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on KF/TiO_2 (12, EtOH, 60), containing 2 mmol KF. One of the degradation products on this sorbent is (2-chloroethyl)(2-fluoroethyl) sulfide. The NMR chemical shifts of this product are overlapping with HD* and bis(2-fluoroethyl)sulfide.



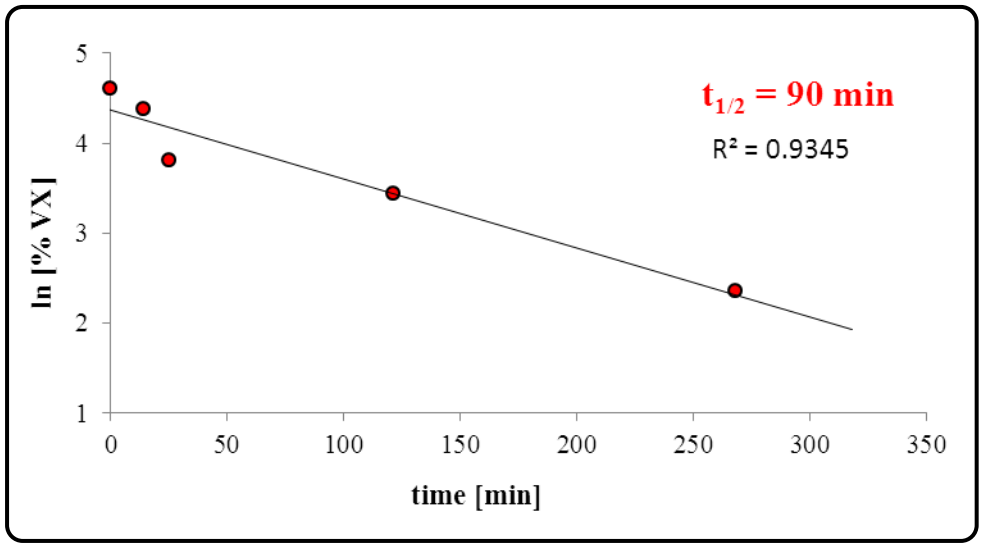


Fig. S13: Selected ^{31}P MAS NMR spectra of adsorbed VX (1% wt) on KF/Al_2O_3 (25, EtOH, 60) and its degradation profile onto this sorbent.

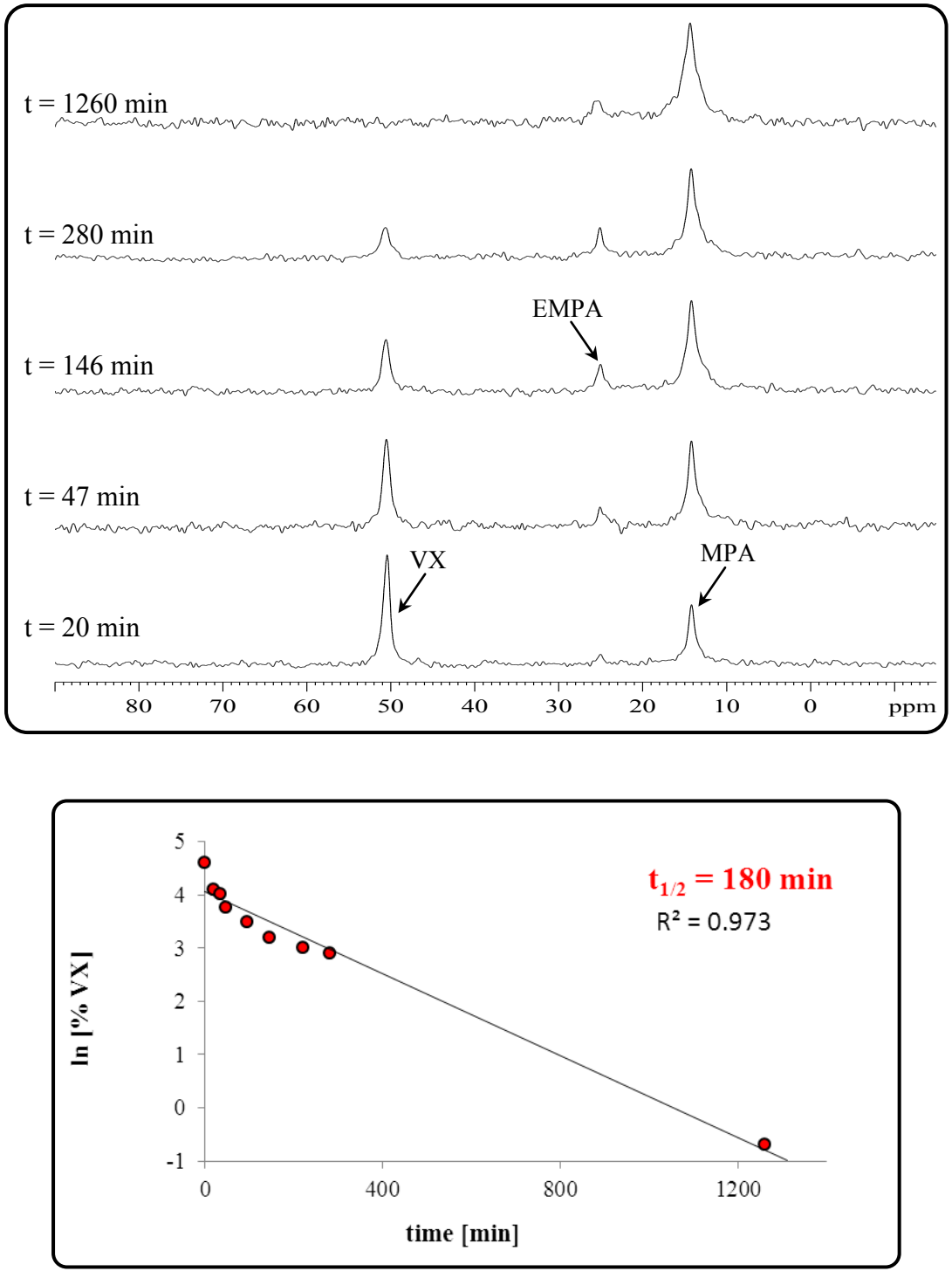
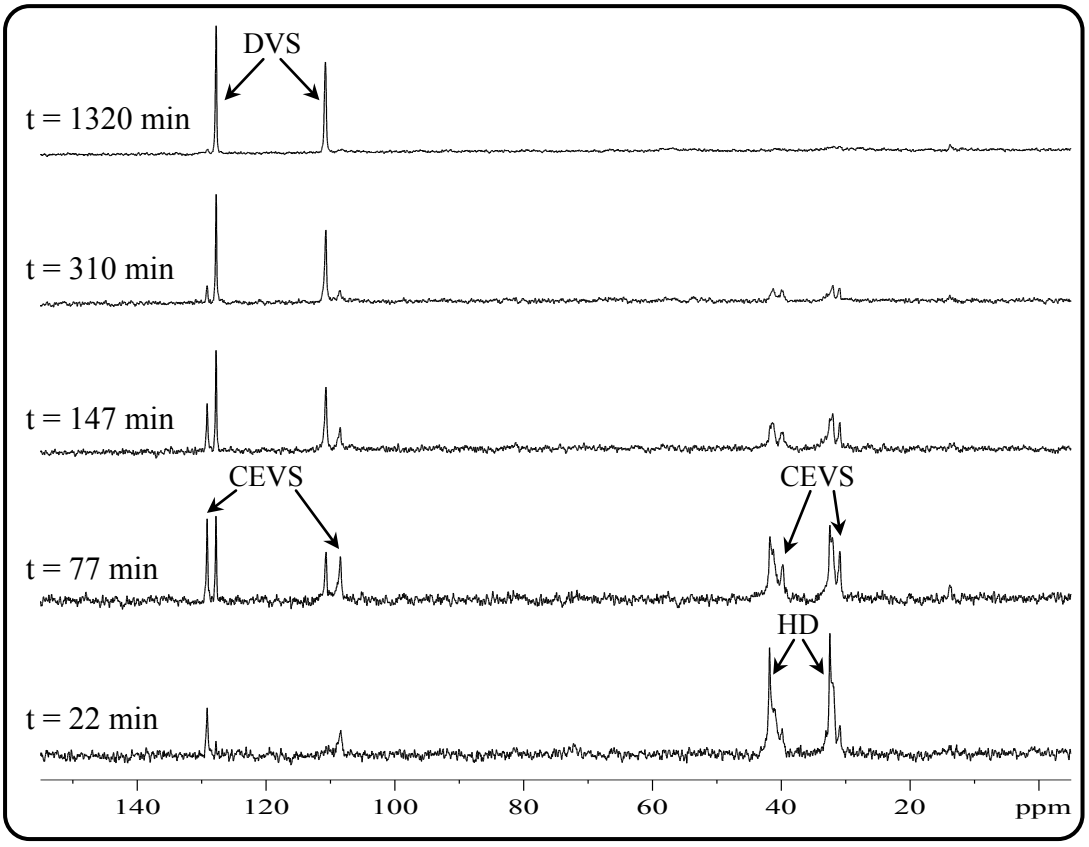


Fig. S14: Selected ^{31}P MAS NMR spectra of adsorbed VX (1% wt) on TBAF/Al_2O_3 (20, EtOH, 60) and its degradation profile onto this sorbent.



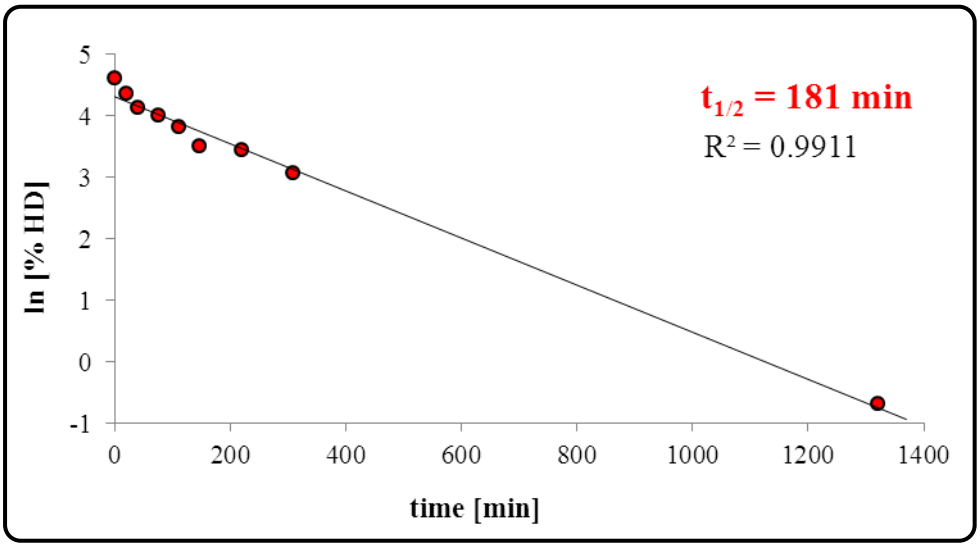


Fig S15: Selected ^{13}C MAS NMR spectra of adsorbed HD* (1% wt) on KF/Al_2O_3 (25, EtOH, 60) and its degradation profile onto this sorbent.

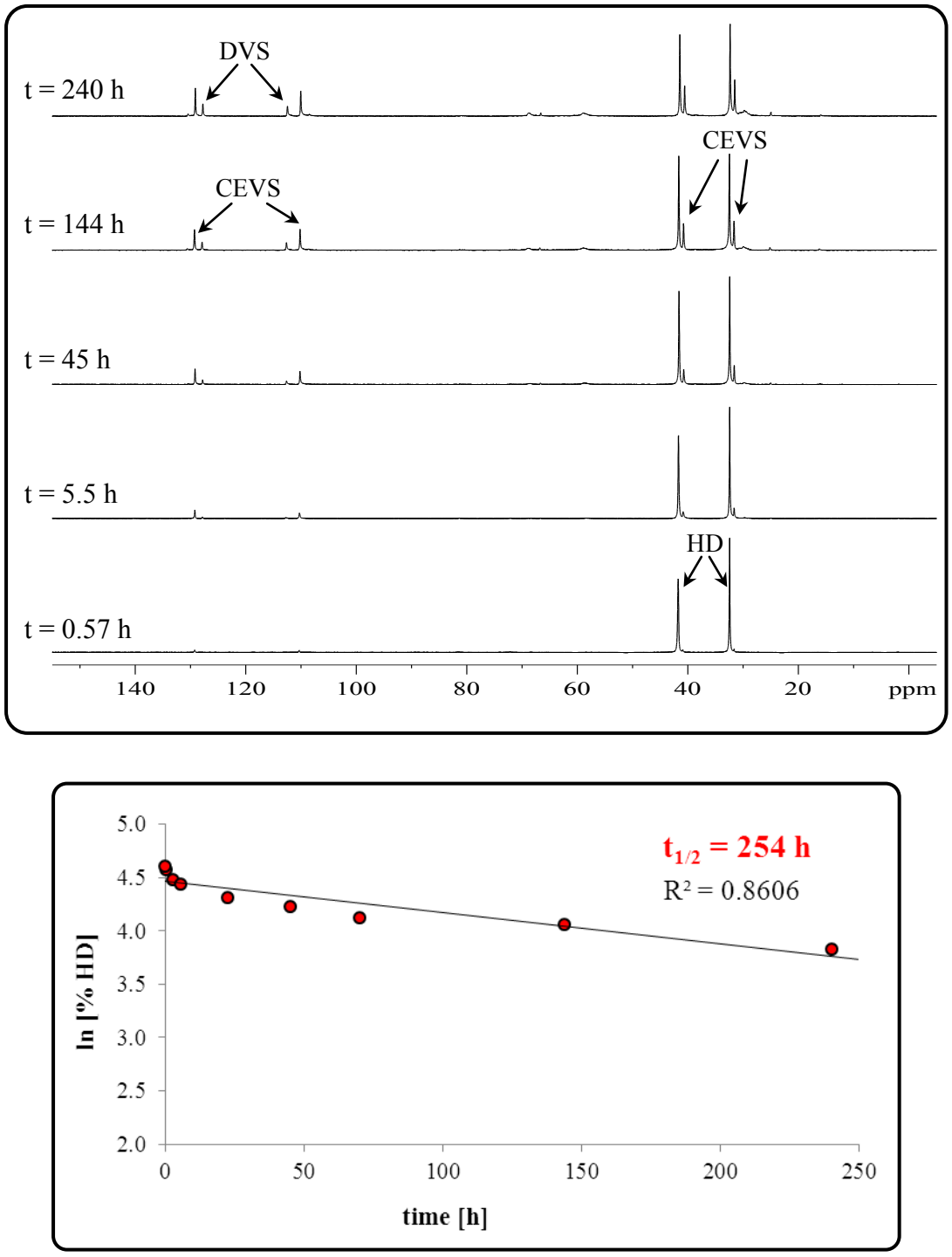
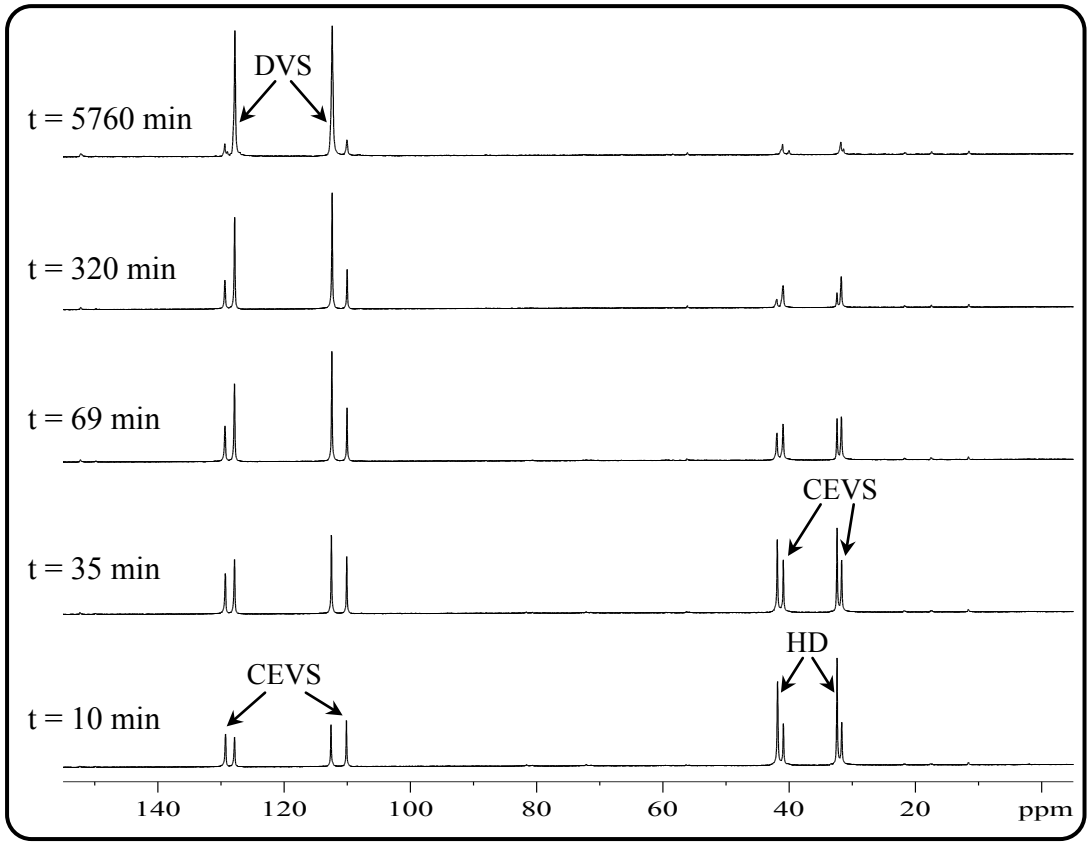


Fig. S16: Selected ^{13}C MAS NMR spectra of adsorbed HD* (10% wt) on KF/Al_2O_3 (25, EtOH, 60) and its degradation profile onto this sorbent.



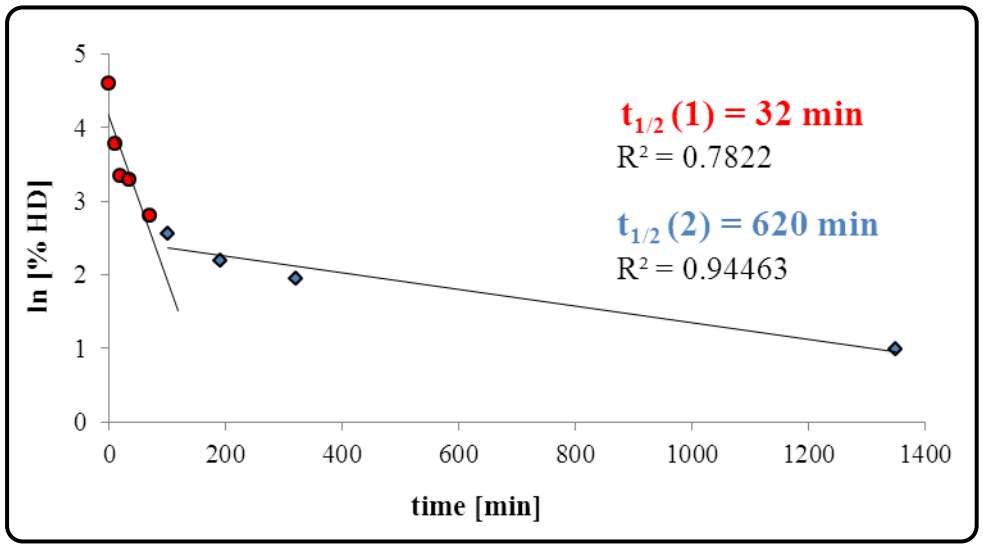
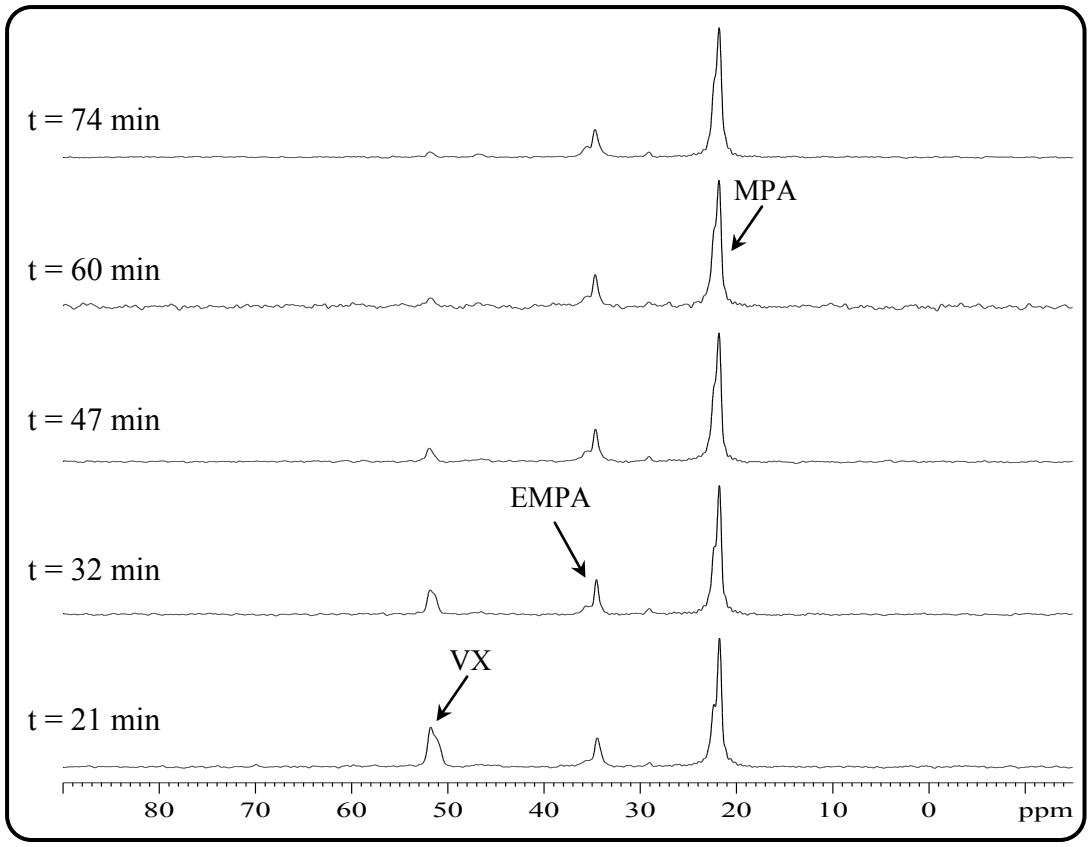


Fig. S17: Selected ^{13}C MAS NMR spectra of adsorbed HD* (10% wt) on TBAF/KF/Al_2O_3 (20, 20, EtOH, 60) and its degradation profile onto this sorbent.



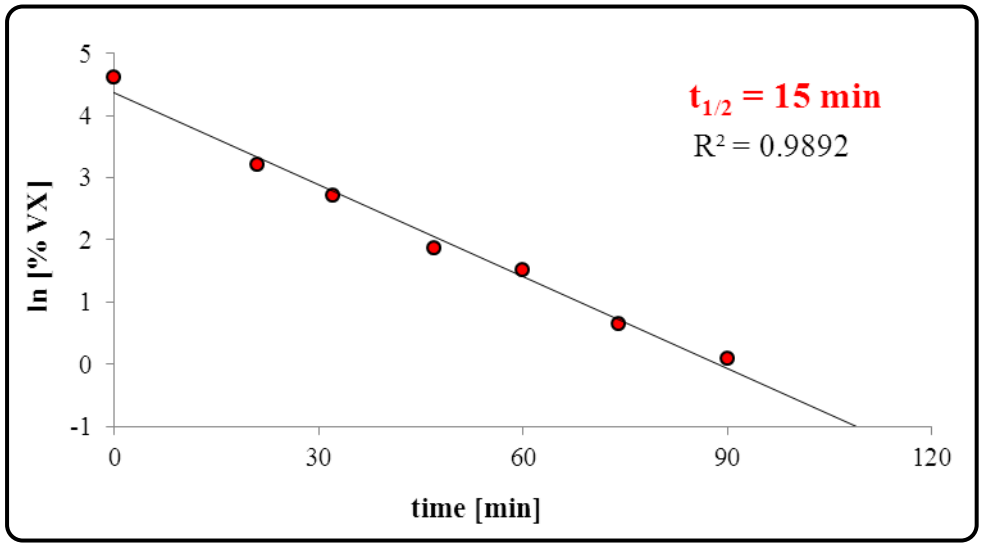


Fig S18: Selected ^{31}P MAS NMR spectra of adsorbed VX (10% wt) on TBAF/KF/Al_2O_3 (20, 20, EtOH, 60) and its degradation profile onto this sorbent.

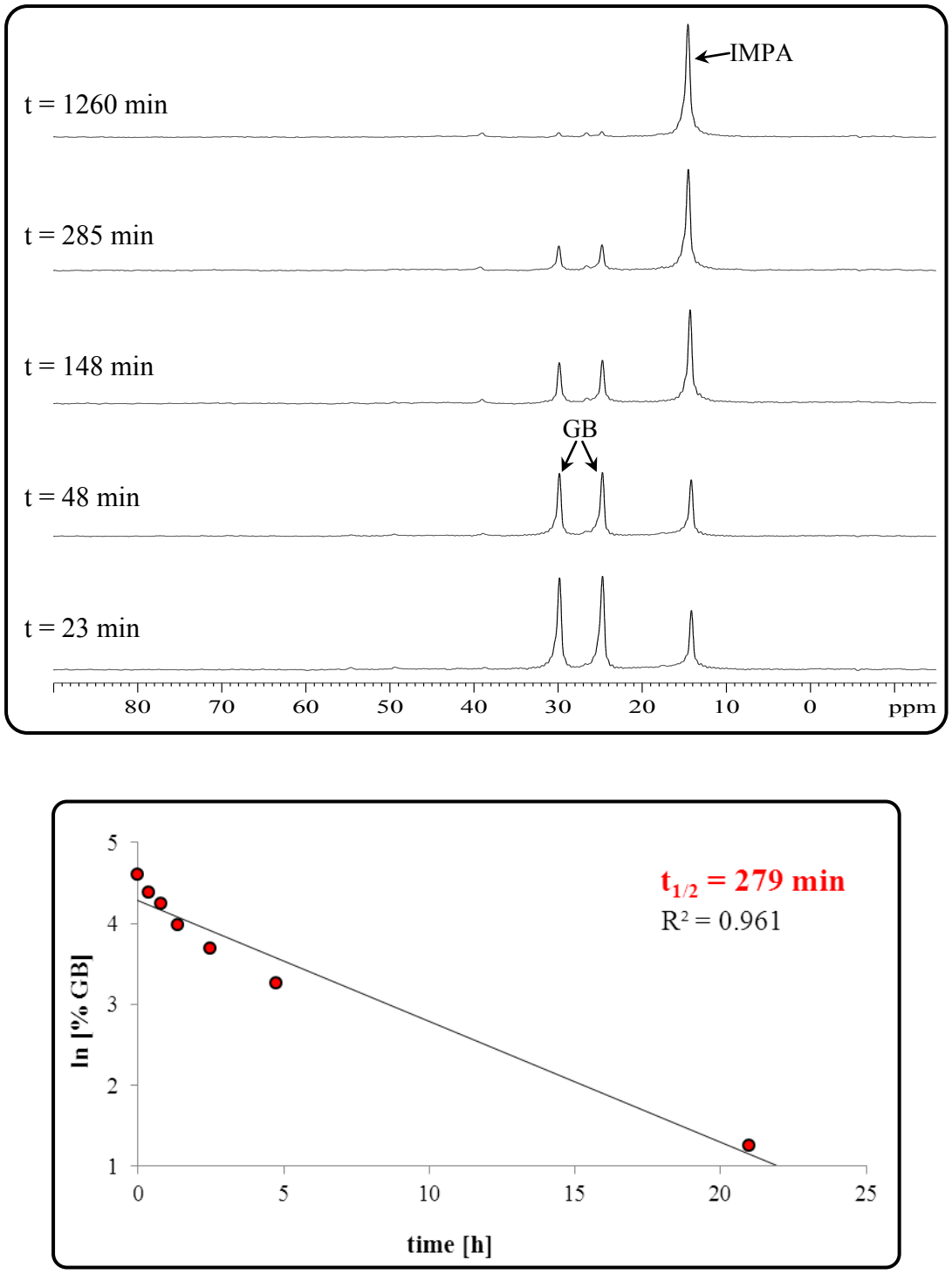


Fig S19: ^{31}P MAS NMR spectra of adsorbed GB (10% wt) on TBAF/KF/Al_2O_3 (20, 20, EtOH, 60) and its degradation profile onto this sorbent.

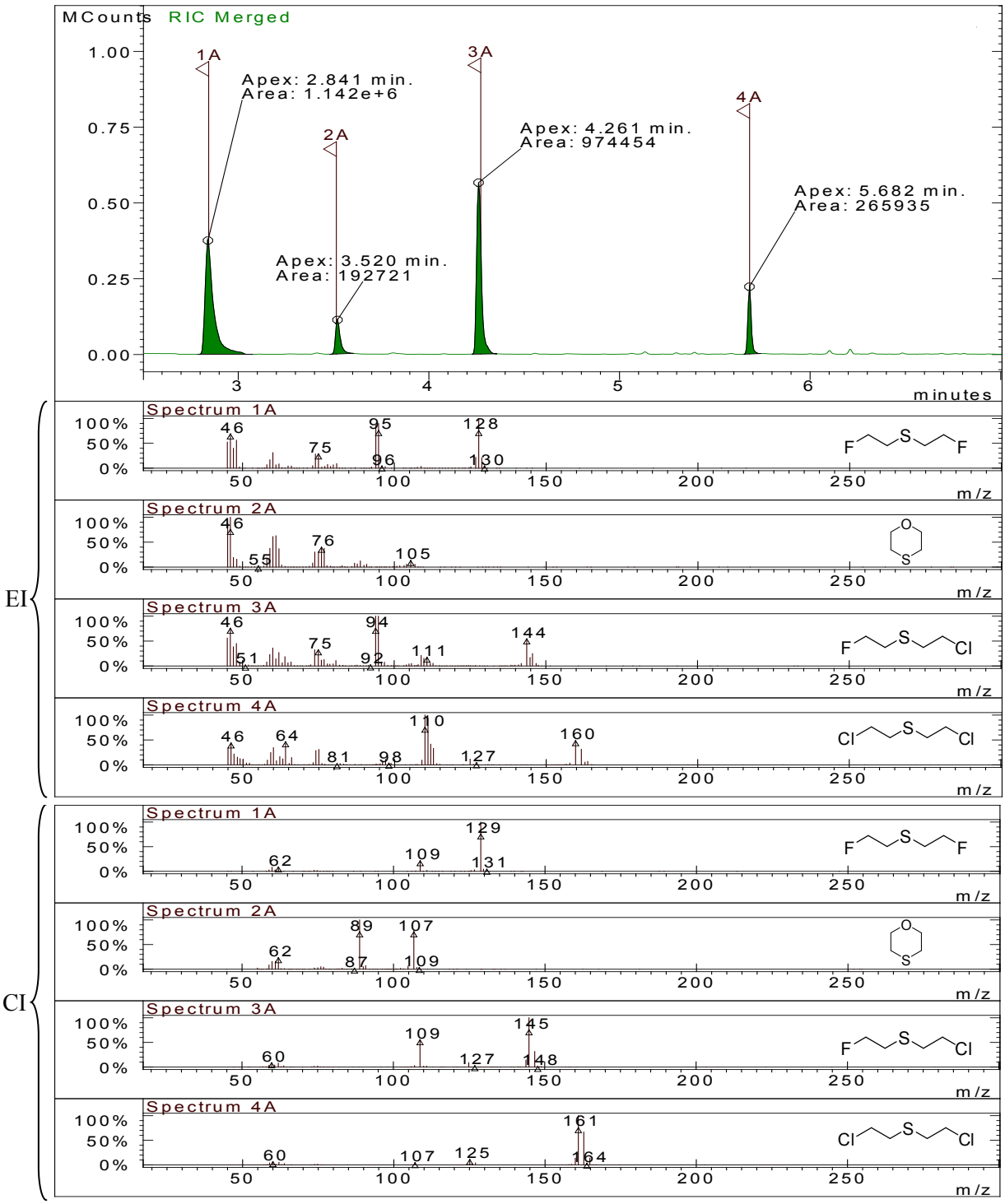


Fig. S20: The GC-MS-EI chromatogram and the EI and CI mass spectra of the degradation products from the extraction mixture of HD* on KF/TiO_2 (12, EtOH, 60).