

1. Equilibrium studies of [Al(AMPTA)], [Al(AMPDA-HB)] and [Al(CD3A-Bn)]

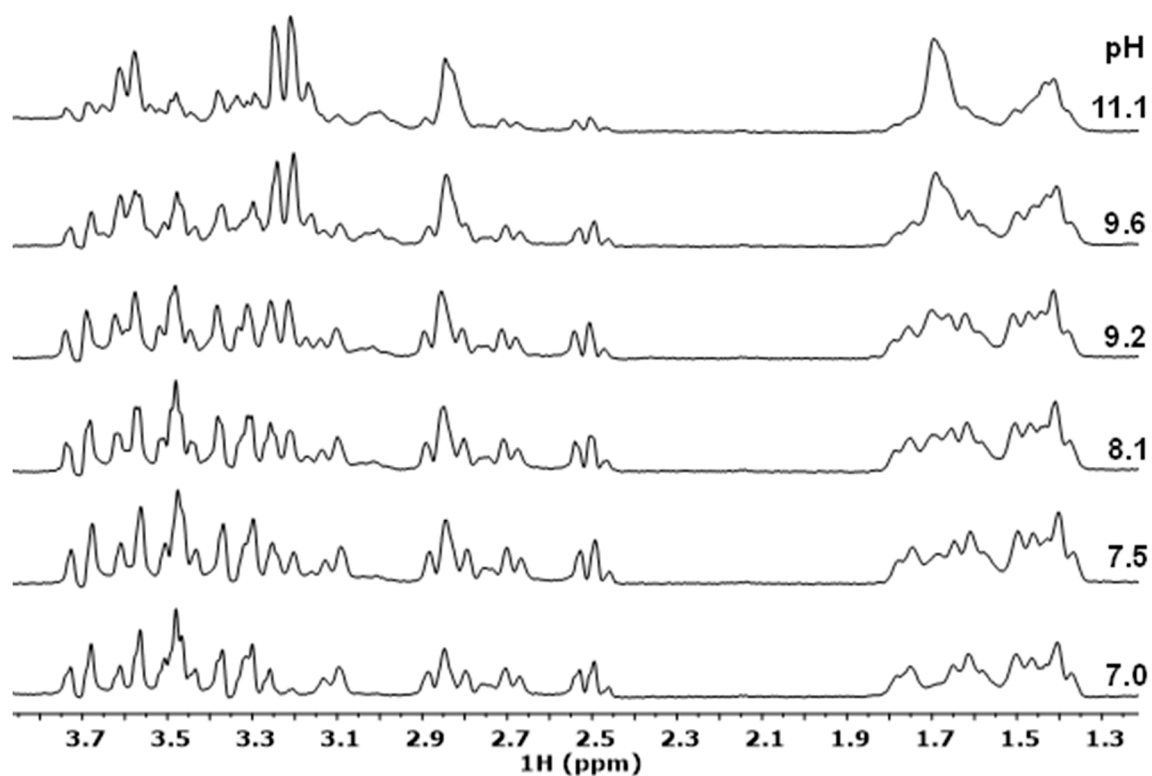


Figure S1. ^1H NMR spectra of the Al^{3+} - AMPTA system ($[\text{Al}^{3+}] = [\text{AMPTA}] = 5.0$ mM, 9.4 T, 0.15 M NaNO_3 , 25 $^\circ\text{C}$).

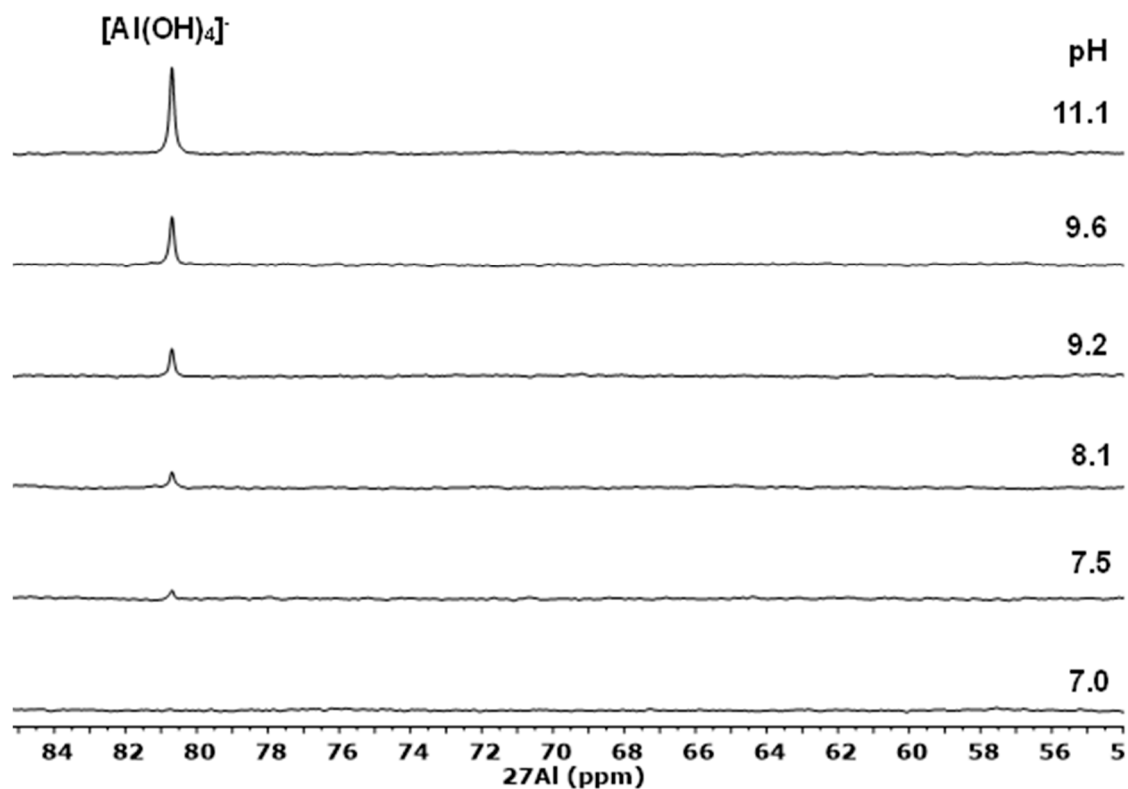


Figure S2. ^{27}Al NMR spectra of the Al^{3+} - AMPTA system ($[\text{Al}^{3+}] = [\text{AMPTA}] = 5.0$ mM, 9.4 T, 0.15 M NaNO_3 , 25 $^\circ\text{C}$).

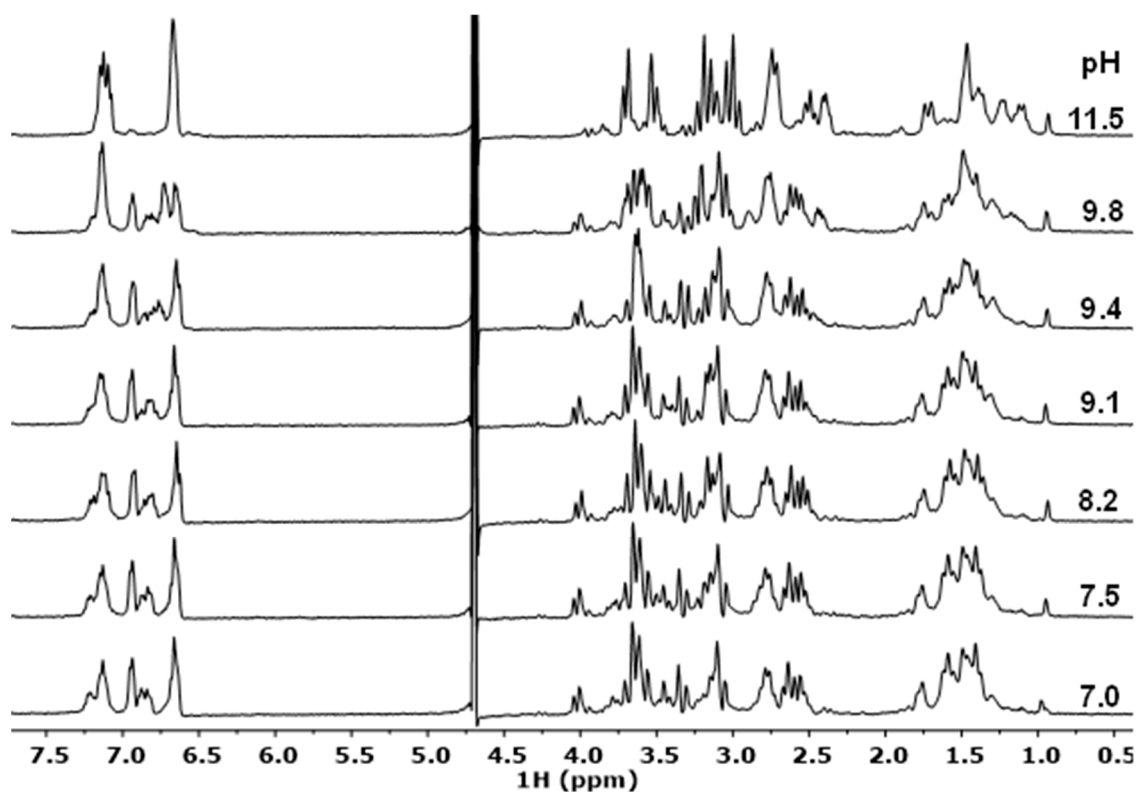


Figure S3. ^1H NMR spectra of the Al^{3+} - AMPDA-HB system ($[\text{Al}^{3+}] = [\text{AMPDA-HB}] = 5.0$ mM, 9.4 T, 0.15 M NaNO_3 , 25 $^\circ\text{C}$).

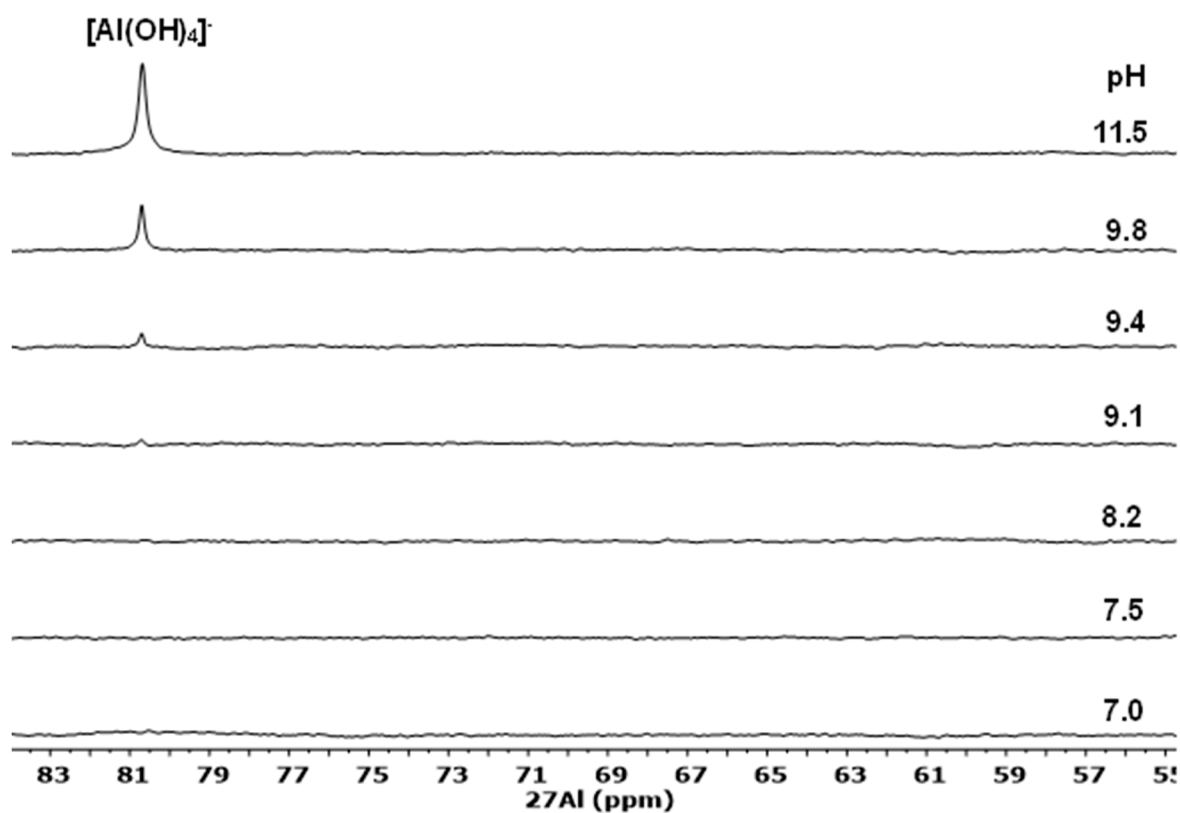


Figure S4. ^{27}Al NMR spectra of the Al^{3+} - AMPDA-HB system ($[\text{Al}^{3+}] = [\text{AMPDA-HB}] = 5.0$ mM, 9.4 T, 0.15 M NaNO_3 , 25 $^\circ\text{C}$).

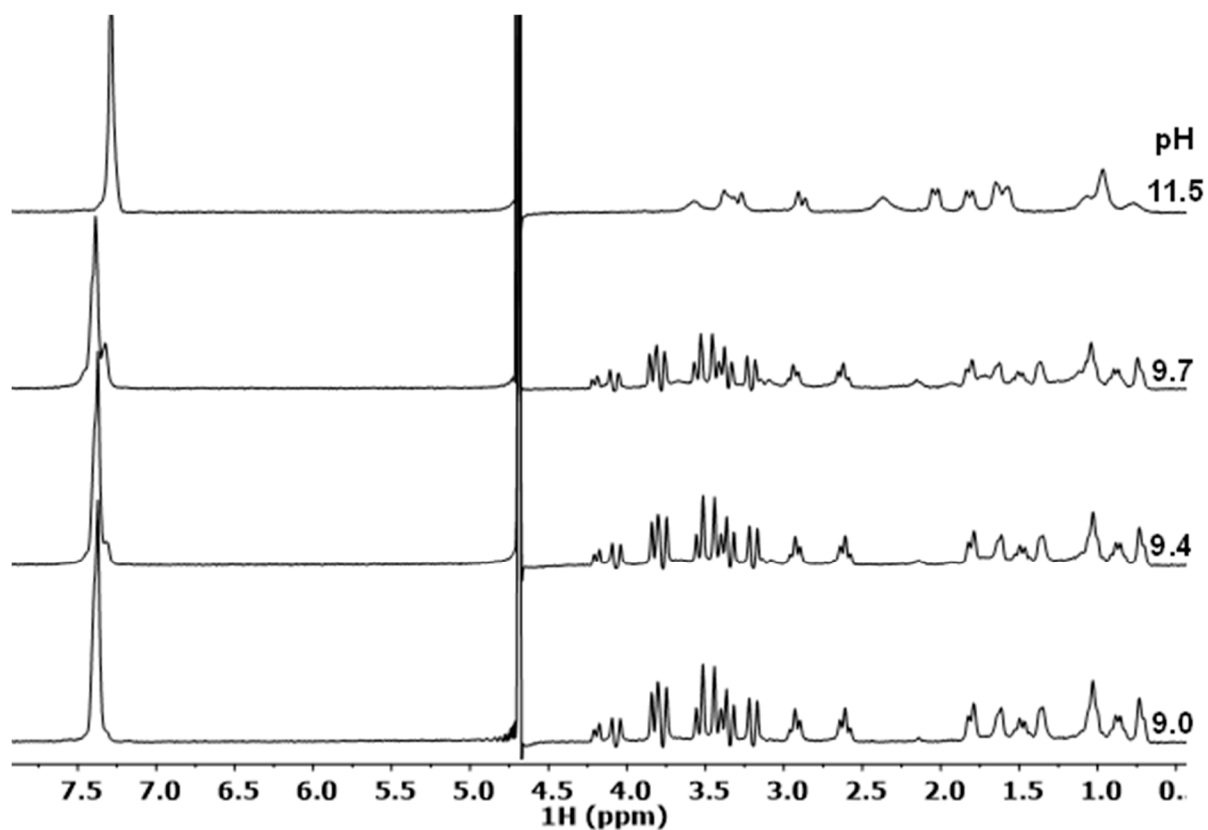


Figure S5. ^1H NMR spectra of the Al^{3+} - CD3A-Bn system ($[\text{Al}^{3+}] = [\text{CD3A-Bn}] = 4.0$ mM, 9.4 T, 0.15 M NaNO_3 , 25 $^\circ\text{C}$).

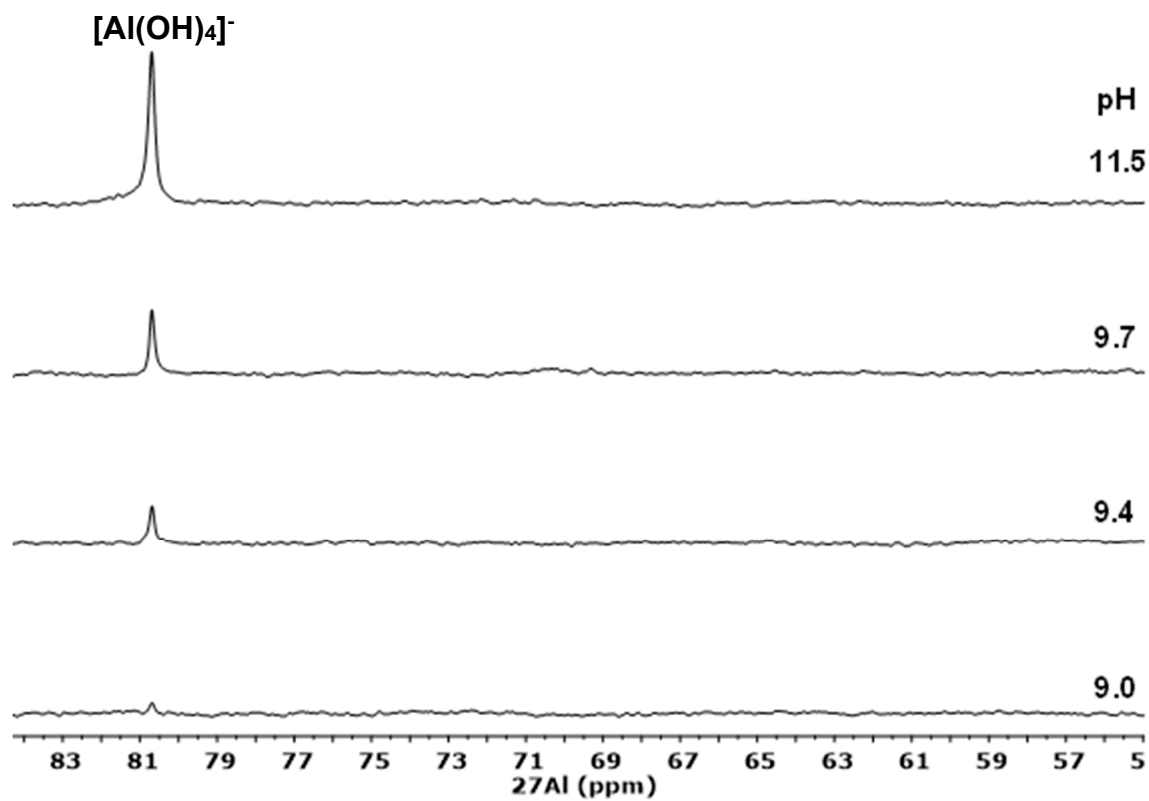


Figure S6. ^{27}Al NMR spectra of the Al^{3+} - CD3A-Bn system ($[\text{Al}^{3+}] = [\text{CD3A-Bn}] = 4.0$ mM, 9.4 T, 0.15 M NaNO_3 , 25 $^\circ\text{C}$).

2. ^{27}Al NMR spectra

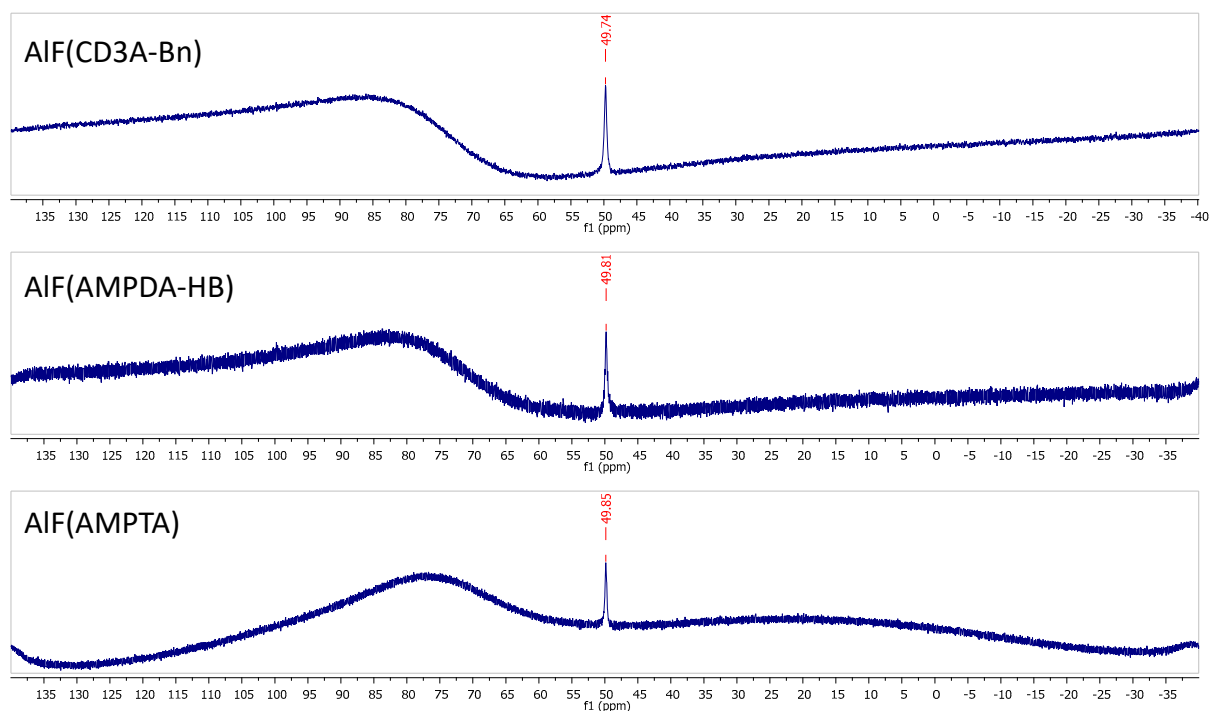


Figure S7. ^{27}Al NMR spectra of the Al^{3+} complexes of ligands AMPTA (*bottom*), AMPDA-HB (*middle*) and CD3A-Bn (*top*) at pH 7 and 25 °C.

3. Stability studies in serum

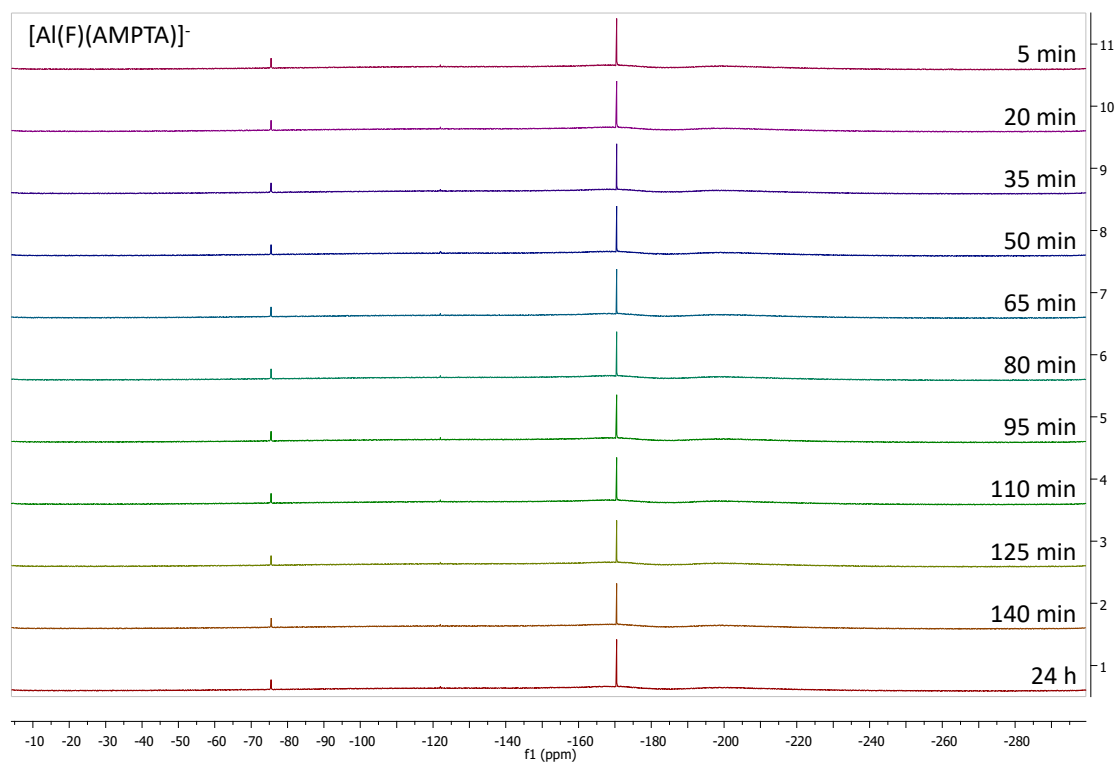


Figure S8. ^{19}F NMR spectra of the $[\text{Al}(\text{F})(\text{AMPTA})]^-$ complex at different times after addition of human serum ($[\text{complex}] = 6.6 \text{ mM}$, $\text{D}_2\text{O} = 0.5 \text{ mL}$, Seronorm = 43 mg, pH 7, 25 °C); resonances from TFA (-76.8 ppm) and AlF_3 (-123.2 ppm) are also observable.

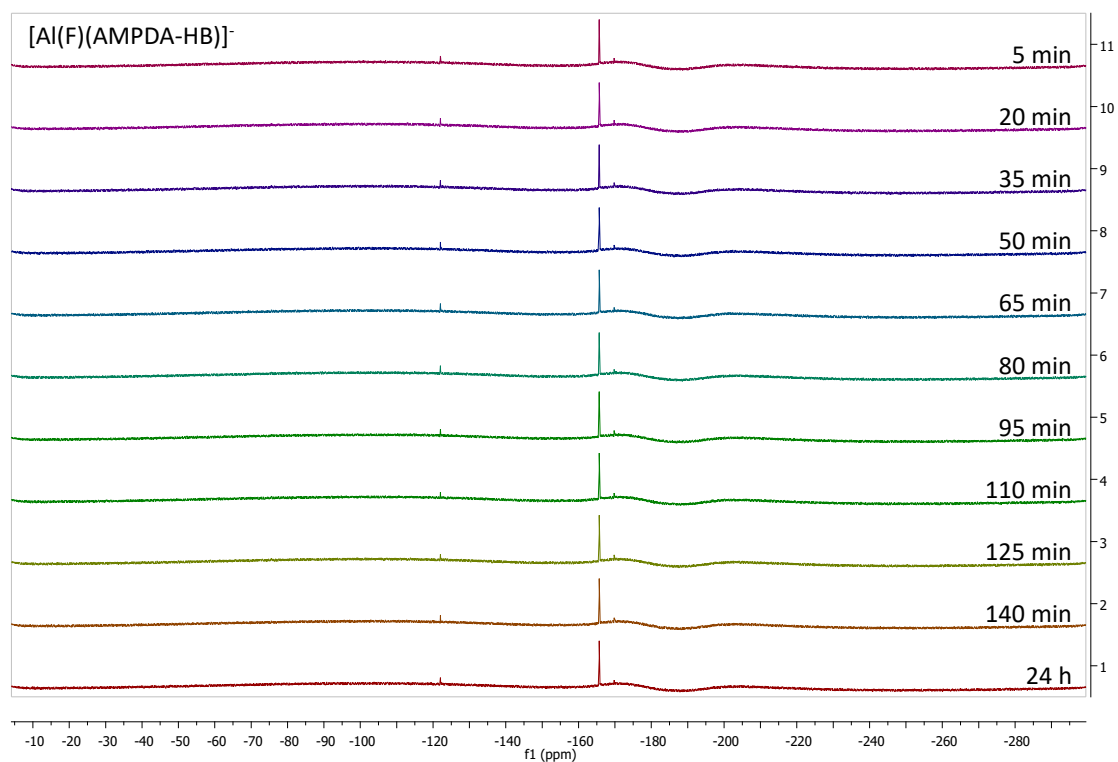


Figure S9. ^{19}F NMR spectra of the $[\text{Al}(\text{F})(\text{AMPDA-HB})]^-$ complex at different times after addition of human serum ($[\text{complex}] = 4.6 \text{ mM}$, $\text{D}_2\text{O} = 0.5 \text{ mL}$, Seronorm = 43 mg, pH 7, 25°C); resonances from AlF_3 (-123.2 ppm) are also observable.