Hydrolysis kinetics of silane coupling agents studied by near-infrared spectroscopy plus partial least squares model

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**Supplemental Materials**

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**Figure S 1:** Calculated [H2O] (a) and [H2O]-1(b) during the hydrolysis processes of VTES at 15 ºC with different [H+]: (1) 0, (2) 1.43x10-4 mol/L, (3) 2.86x10-4 mol/L, (4) 5.71x10-4 mol/L, (5) 1.31x10-3 mol/L, (6) 2.86x10-3 mol/L.



**Figure S 2:** Calculated [H2O] (a) and [H2O]-1(b) during the hydrolysis processes of 3-MTES at 15 ºC with different [H+]: (1) 0, (2) 2.63x10-4 mol/L, (3) 5.26x10-4 mol/L, (4) 1.31x10-3 mol/L, (5) 2.63x10-3 mol/L.

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**Figure S 3:** Calculated [H2O] (a) and [H2O]-1(b) during the hydrolysis processes of 3-CTES at 15 ºC with different [H+]: (1) 0, (2) 5.28x10-4 mol/L, (3) 1.31x10-3 mol/L, (4) 2.64x10-3 mol/L.

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**Figure S 4:** Calculated [H2O] (a) and [H2O]-1(b) during the hydrolysis processes of VTES under different temperatures and [H+] is 1.31×10-3 mol·L-1.

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**Figure S 5:** Calculated [H2O] (a) and [H2O]-1(b) during the hydrolysis processes of 3-MTES under different temperatures and [H+] is 1.31×10-3 mol·L-1.

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**Figure S 6:** Calculated [H2O] (a) and [H2O]-1(b) during the hydrolysis processes of 3-CTES under different temperatures and [H+] is 1.31×10-3 mol·L-1.