

Abstract of poster:

Periodic pulses of fluoride ions in a chemical system

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Periodic pulses in the concentration of fluoride ions were induced by coupling a precipitation reaction ($\text{Al}^{3+} + 3 \text{H}_2\text{O} \leftrightarrow \text{Al}(\text{OH})_3 + 3 \text{H}^+$) and a complex formation equilibrium ($\text{Al}^{3+} + n \text{F}^- \leftrightarrow \text{AlF}_n^{(3-n)-}$) to a pH-oscillator ($\text{BrO}_3^- - \text{SO}_3^{2-} - \text{Mn}^{2+}$). The oscillations in the concentration of free fluoride ions – which can be as large as 3 order of magnitude – are generated by the pH-driven periodic formation and dissolution of $\text{Al}(\text{OH})_3$ followed by fast complex formation between Al^{3+} and F^- ions.

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