

# The Chemist's Interactions

Seminars @ the Chemistry Department

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Mineral self-organization in a lifeless planet.  
Its role in prebiotic chemistry and primitive life detection

Earth is the only known Solar System body where mineral matter self-organized into micrometer sized structures that can display complex behaviors and shapes, capable to evolve by replication. We call these self-organized structures living organisms, and organic chemistry is the carbon-based set of reactions characterizing their function. Ubiquitous as life is today, and as it was during most of its geological history, Earth was once devoid of life. Based on the currently available information regarding the Hadean, it seems most probable that water condenses on the surface of the Earth soon after solidification of its first ultramafic crust. The thermally-driven interaction between water and ultramafic minerals – serpentinization – created an alkaline, silica-rich, and rather reduced hydrosphere, triggering the formation of complex organic compounds. I propose that this global geochemical scenario triggered the formation of silica based self-assembled mineral structures that had a major role in the transition from inorganic geochemistry to organic chemistry, and ultimately to the origin of life itself.



The Virtual Seminar Series will be broadcast with the Zoom software.

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