

## Serpentinized mantle and formation of plate boundaries

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1) Initiation of subduction, 2) generation of divergent boundaries, and 3) generation and evolution of transform faults, i.e., initiation of plate tectonics, is one of the most difficult problems of earth sciences. Although it is inferred that H<sub>2</sub>O had an intimate relationship to the initiation because there is no plate tectonics on Venus, it is not easy to clarify how it was related.

I propose here that the dehydration of the serpentinized mantle in the stagnant lid played an essential role in the formation of plate boundaries, during the transitional stage from the magma ocean. They are: 1-1) Serpentinization of the lower part of the lid by uprising plumes, 1-2) Dehydration of the serpentinized lid when it was dragged down into the mantle by thrusting/folding, resulting in the lubrication of the thrust and initiation of subduction, 2-1) Rifting in the opposite part of the lid by slab pull, 2-2) Initiation of a divergent boundary when the rift was serpentinized and attacked by an uprising plume, 3) Initiation and development of transform faults from the serpentinized divergent boundary or from the serpentinized wedge mantle in the convergent boundary.