

OCEAN IMPACT EVIDENCES OF SEA-SEDIMENT REMNANTS ON WATER-EARTH

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Introduction: Impact evidences of dry rocky impact craters of planets and other celestial bodies are based on remained shock metamorphic rocks [1-3]. However, ocean-impacts on water Earth with major global ocean surface are exceedingly difficult to study because of global ocean mixing and crater broken by moved ocean bottom floors. The present paper is to elucidate impact evidences of related sea-sediments on water-planet Earth [4-8].

Shock metamorphism on dry rocks: Impact craters on rocky targets of Earth's continental surface on Earth (29.2 vol.%) are mainly discussed by remained shock indicators of geophysics, geochemistry and geo-minerals including high-pressure shock on dry targets applied also to extraterrestrial rocks [1-3]. The dry rock process is explained local solid-vapor change with quenched by air cooling condition.

Shock metamorphism on wet rocks quenched with wide ocean water: Ocean impact signatures on global water-planet are considered to be 1) discarded sea-bottom impact-blocks near oceanic islands moved sea-floors widely (as in Akiyoshi-dai-limestone case), 2) buried impact-structure broken partly by moved crust plates locally (as in Takamatsu case in Japan), and 3) elemental enrichments of Earth and meteoritic metals formed by impact mixing as new ocean-related indicators which are obtained in recent formed Japanese islands and old continental crust supplied by ocean plates [2-3]. This shock type is based on solid-liquid-air process during short fluid reaction followed quenching, which is similar with magmatic melting process for elemental and mineral assemblage largely at volcanic crusts.

Laboratory impacts at sedimental rocks in wet liquid condition: Microscopic elements-bearing quenched grains from sea-sedimental rock used by the laser beam in author's laboratory, which are confirmed by bulk XRF and electron microscopic data. The volatile-bearing quenched grains which is assumed to be ocean impact indicators be obtained in the Akiyoshi-dai and Takamatsu drilled cores of possible ocean-impacts on water-Earth [6-9]

Water produced experiment from meteorites to apply on extraterrestrial surfaces: Author has produced fluid-water from dry meteorite in author's laboratory. Dry rocks of waterless planets and asteroids can be applied the shocked rocks of dry rocks on Earth, which are evaporated volatiles to be formed crystalline minerals globally and largely. Therefore, water effects on mixed extraterrestrial and terrestrials rocks are clearly different with local formation and global ocean water, respectively. Fluid-contribution of extraterrestrial surfaces are clearly different with dry terrestrial rocks with well crystallized minerals. This indicates that existence of global water on extraterrestrial bodies can be explained not by simple water elements but by wide ocean sedimental rocks on unknown bodies [8-9].

Indicator of Earth-like planets and exo-life observation: Sea-sediment rocks are only direct formation of global ocean water on planet, which are considered to be strong indicator of water Earth-like planet and possible exo-life on extraterrestrial planets for future remote-sensing observation from our planets of the Solar System [7-9].

Summary: The present study is summarized as follows: 1) Dry shocked rocks of Earth and extraterrestrial bodies are shocked rocks of simple solid-air reaction with impact structures. 2) Wet shocked rocks of Earth's ocean surface are discarded shocked rocks and structures globally and enriched elements during surface melting with the continental drift with sea-sediment rocks, which is considered to be strong indicator of global ocean water of extraterrestrial bodies. 3) Sea-sedimental rocks are only direct formation of global ocean water on planet as strong indicator of water Earth-like planet and possible exo-life on extraterrestrial planets/

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