The Santa Fe impact structure shows all samples with remained carbon-bearing grains separated by impact from original sedimentary carbonates of the Paleozoic shallow floors, which can be applied to other ocean impact structures.

3. Observation of analytical FE-SEM

Author’s research group has been established investigation method of impact samples formed by natural ocean sediment in water condition and by laboratory shocked experiments [5-8], where two different methods are used to observe in-situ surface (as grains) and polished thin-section for carbon-bearing remnants. The samples collected at the Santa Fe mountain district guided with the New Mexican scientists have been investigated in-situ analytical scanning electron microscopy (analytical FE-SEM of the JEOL Co. Ltd.) as follows [5-8] (Fig.2):

1) Carbon-rich breccias are observed all of three types of a) granitic rocks, b) limestone carbonates and c) plagiogranitic samples, which suggest that carbon-rich grains with Ca or Mg are originated from broken limestone rocks.

2) Carbon-rich fluid-flow textures with Ca, Mg and Fe which are fluid-like formation during quenching in sea-water are obtained at three a) and b) samples penetrating to these original rocks, and c) samples of sea-bottom crust of plagioclase (anorthite)-granitic rocks by penetrating texture [9-10], which suggest evidences of impacted ocean floor rocks.

4. Conclusion

The Santa Fe impact structure samples is summarized in this study as follows:

1) Ocean impact remnants by carbon-bearing grains are obtained from two types of grains and thin section at the Santa Fe impact structure.

2) Carbon and carbon-bearing materials from ocean sediments separated by impact process are obtained all samples of granitic breccias, limestone breccias and plagiogranitic rocks of ocean floor crusts.

3) Carbon-rich fluid textures with Ca, Mg and Fe quenched from ocean sediments are obtained at the three types samples penetrating to these original rocks, which are considered to be strong evidences of impacted ocean floor rocks.

4) Main reason to observe the ocean impact remnants on the higher mountain is associated with the Rio Grande rift in the New Mexico earthquake different with other quakes of colliding (Japan) and side-slipping (California).

Fig.2. Thin section (above) and impact grains (below) of the Santa Fe impact structure, New Mexico, USA [5]. Impact melt breccias.

References


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