**Table A3:** Overview of the first set of samples from Crater No. 4 (Emmerting) – basic characteristics, high-temperature and deformation processes, magnetic susceptibility.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Rock type** | **Crusts, etc. (pre-impact)** | **In-situ fracturing** | **Glass coating, melting, traces of decarbonatization** | **Deformation during crater formation and its relation to melting; secondary projectiles, etc.** | **MS (10-3 SI)** |
| **401** | quartzite with biotite \* | partly bright crust | ? (timing unclear) | thin colorless surface glass at one side | no | 1.06–1.21 |
| **402** | limestone | dark Mn oxides? | possibly very weak | surface decarbonization – white “chalk” | no | 0.04–0.12 |
| **403** | impure sandstone / quartzite? \*\* | limonite in places? | widening fractures (rotation) | colorless glass coating + various contaminations (dark Fe-enriched melt) | extreme deformation with some pushing of external dark melt into wide fractures; limestone? stuck on the melt | 1.72–7.11 |
| **404** | quartzite with biotite \* | limonite in places? | probably not | melting of biotite; colorless glass upside | expansion of biotite pulling apart the quartz grains | 0.67–2.29 |
| **405** | limestone | crust (corrosion layer) | possibly very weak | possibly decarbonization in places | no | 0.45–0.99 |
| **406** | dolomite | probably not | ? | surface decarbonization – expanded layer | possibly irregular fracturing | 0.32–0.88 **fr** |
| **407** | sandstone | minor Mn-oxides | not observed | joined by green glass with the diorite | no deformation inside observed | 2.62–8.06 |
| diorite / granitoid? | not observed | probably in quartz | melting: feldspars and biotite | deformation after melting, including stretched bridges |
| **408** | limestone | no | probable, irregular | locally surface decarbonization | no | 0.07–0.09 |
| **409** | sandy limestone \* | silicate crust, limonite | possibly minor | thin glass (K-rich) covering silicate crust | no | 0.16–0.45 fr |
| **410** | mica-schist or similar \* | minor white crust | break-off | no | possibly some stretching (without melting) | 0.11–0.74 |
| **411** | vein quartz \* | hollows after crystals | not observed | very thin glass cover in places | limited extension with stretched bridges | 0.16–0.43 |
| **412** | sandstone | locally lichen | probable | thin glass coating (except of bottom side) | no | 0.62–0.72 |
| **413** | sandy limestone? | corrosion | not significant | ? (possibly decarbonization) | ? (possibly expansion of CO2) | 0 |
| **414** | vein quartz \* | uncertain | ? (break-off) | thin surface glass at one side | no | 0 |
| **415** | sandstone? \*\* | limonite (in fracture), lichen | yes; break-off along older? fracture | colorless glass deposited from upside | open fractures after the strike, stretched bridges | 2.39–7.54 |
| **416** | orthogneiss? | locally limonite, carb. | probably in quartz | glass from feldspar and biotite | mainly gas expansion; secondary projectile (dark melt) | 0.58–1.04 |
| **417** | sandy limestone | corrosion layer, moss, leave fragments | possible (using calcite veinlets) | decarbonization of calcite veinlets, at least where they reached/formed the surface | only CO2 expansion in original calcite | 0.44–0.94 **fr** |
| **418** | quartzite with biotite | moss/lichen | probably not | glass from biotite and limonitized Btt. | very limited expansion of biotite | 7–11.3 |
| **419** | basic rock (amphibolite?) | limonite | ? | almost total melting (except for quartz? veinlets); greenish surface glass (K-rich) | strong expansion; surface contamination by limestone (also expanded) | 0.32–0.79 fr |
| **420** | orthogneiss | weathering, lichen | not observed | colorless glass coating (K-rich); inside melting mainly of feldspars | (only microscopic expansion of gases) | 0.65–2.01fr |
| **421** | quartzite (impure) | limonite? | fractures in two directions filled with melt | melting of chloritized biotite and albite in-side; surface colorless glass, younger black extrusions; “mixed” yellow, brown glass | probably widening of fractures (gas expansion); extrusions of black (mica-derived) melt; brown melt – influenced by surface contamination (Ca, Fe) | 0.72–1.47 **fr** |
| **422** | quartz-albite rock (orthogneiss?) | weathering, lichen | open fractures, intense cleavage | no melting inside; thin colorless surface glass (K-rich) | extreme deformation with stretched bridges (locally mylonitization which may be older) | not measured |

\* significant part of the original pebble was broken off long time prior to sample collection (possibly even prior to crater formation)

\*\* sample was neither cut nor broken in order to preserve the deformation figure undisturbed

fr – frequency dependence of MS was also measured (bold underlined in case that it is significant)