

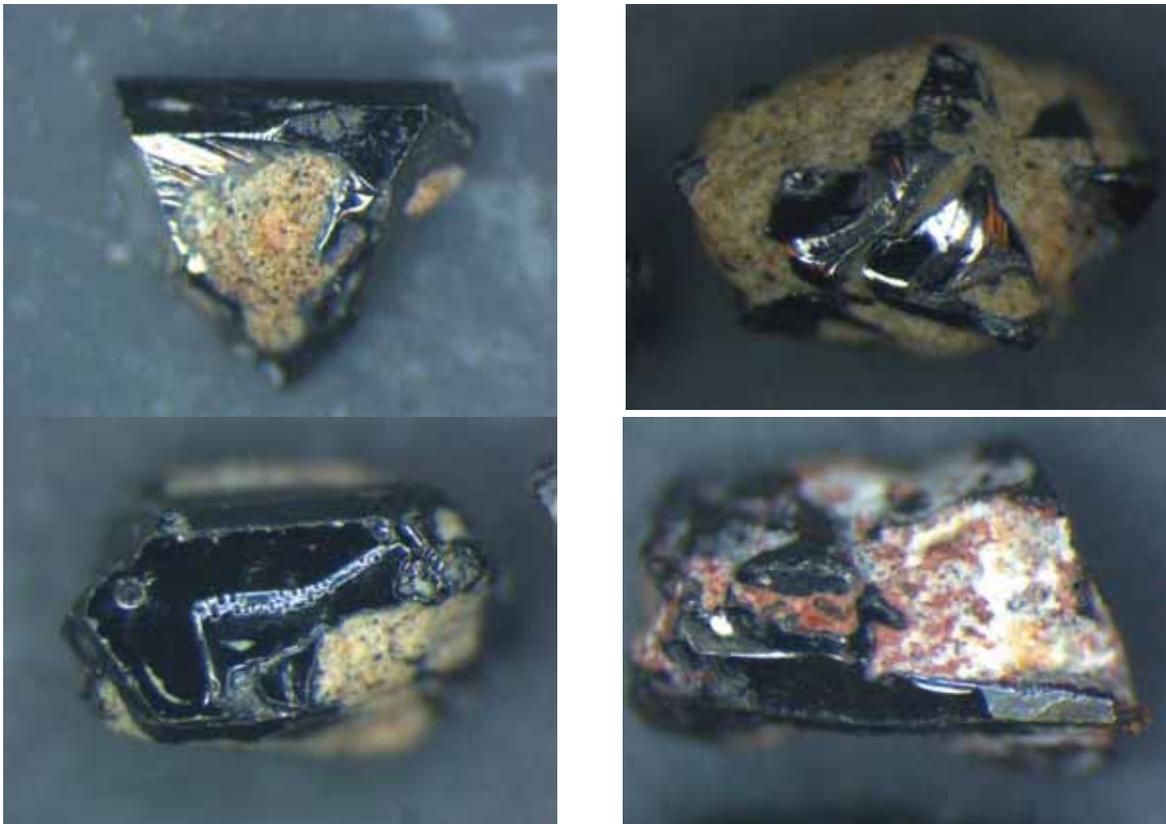
MATERIAL ATTACHED TO SiC MINERAL GRAINS (SHEFA YAMIM PROJECT)

All data are considered for internal use

All samples were analysed on an electron microscope with attached EDS detector without additional preparation

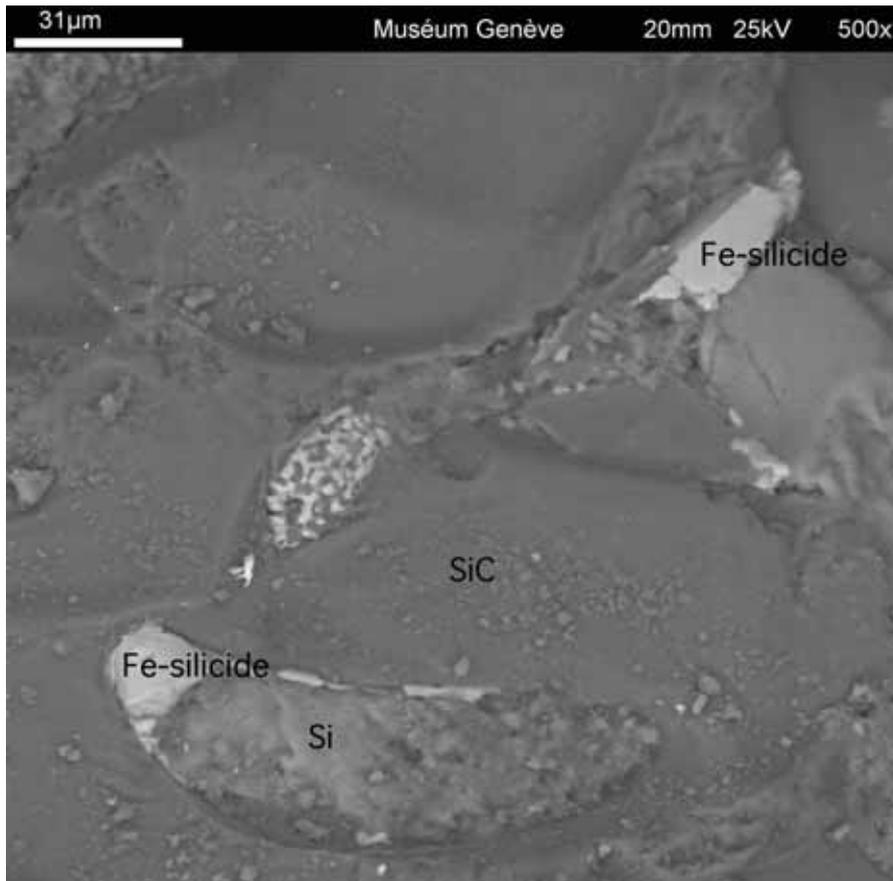
Material attached to SiC grains

The material attached to all six moissanite (SiC) grains investigated (samples 900, 901 and 935) consists of an association of different, unidentified Ca-Fe-Mg-Al-Si-O minerals (silicates and oxides). Some also contain traces of titanium. The material is similar to the fine-grained matrix of the previously analysed sample SY 059. I believe that the attached material is part of the primary “kimberlite”, although locally strongly weathered (formation of Fe-oxyhydroxides).



Photographs of millimetre-sized moissanite grains (black with metallic lustre) and attached light-coloured rock consisting of a mix of different, fine-grained minerals. The rusty to red colours are from staining by Fe-oxyhydroxide minerals produced by alteration. Top left: sample 900; top right: sample 901; bottom left: sample 901; bottom right: sample 935.

Some of the exposed moissanite surfaces display characteristic inclusions of metallic Si in association with a Fe-Si alloy (Fe-silicide; see image below). Fragments of this material also occur in the fine-grained light-coloured material attached to the moissanite grain, supporting the interpretation that the attached material represents is the moissanite host rock.



BSE (backscatter electron image) of metallic Si-Fe inclusion exposed at the surface of a moissanite grain (dark grey) in sample 901. The bright part of the inclusions consists of metallic Si-Fe (Fe-silicide), the light grey part is made of metallic Si. Such inclusions are characteristic for natural moissanite occurrences (they do not occur in synthetic moissanite).

Conclusions

Although moissanite is very resistant to fluvial transport, the attached patches of friable host rock indicate that the grains have not been transported very far from its source. Moreover, they are an additional proof that these very large moissanite grains are from a natural source. To approach the source rock, I suggest continuing prospection in the direction where moissanite grains with attached rock is found.