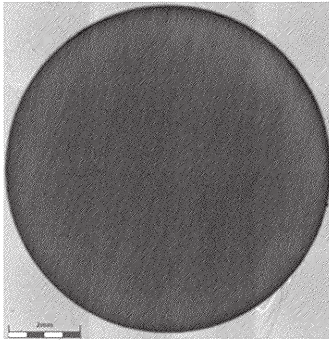


FIG.1A

DETERIORATED LAYER PRESENT



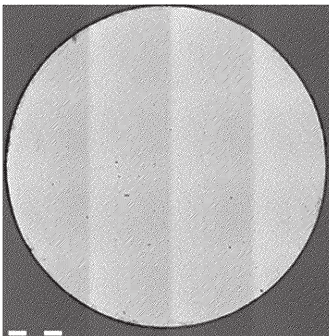
RMS : 50nm

ELECTRON BACKSCATTER DIFFRACTION (EBSD)

When an electron beam is irradiated onto a sample tilted by approximately 60 to 70° , diffracted electron beams are generated from each crystal plane within a region about 50 nm or less from the sample surface. By analyzing this backscattered electron diffraction, information on the orientation analysis of a crystalline sample can be obtained. $\rightarrow$ No pattern obtained (low crystallinity)

FIG.1B

NO DETERIORATED LAYER (AFTER REMOVING DETERIORATED LAYER)

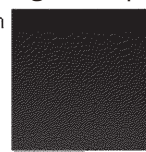


RMS : 10-20nm

EBSD $\rightarrow$ (111) SINGLE CRYSTAL

• INVERSE POLE FIGURE MAP
(Inverse Pole Figure Map)

Z Direction



500 μ m

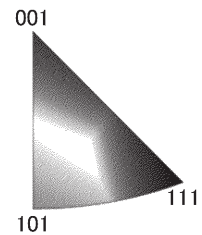


FIG.2

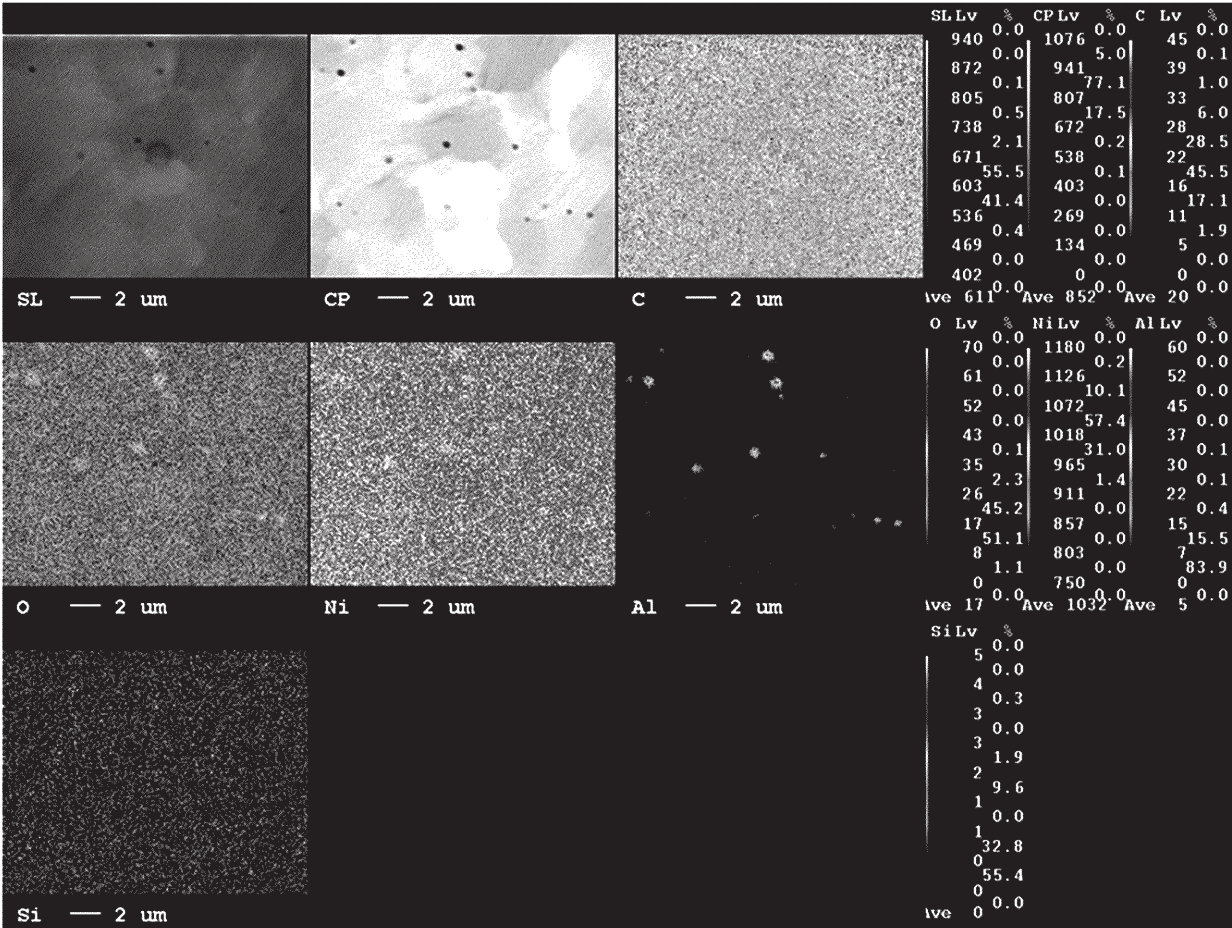
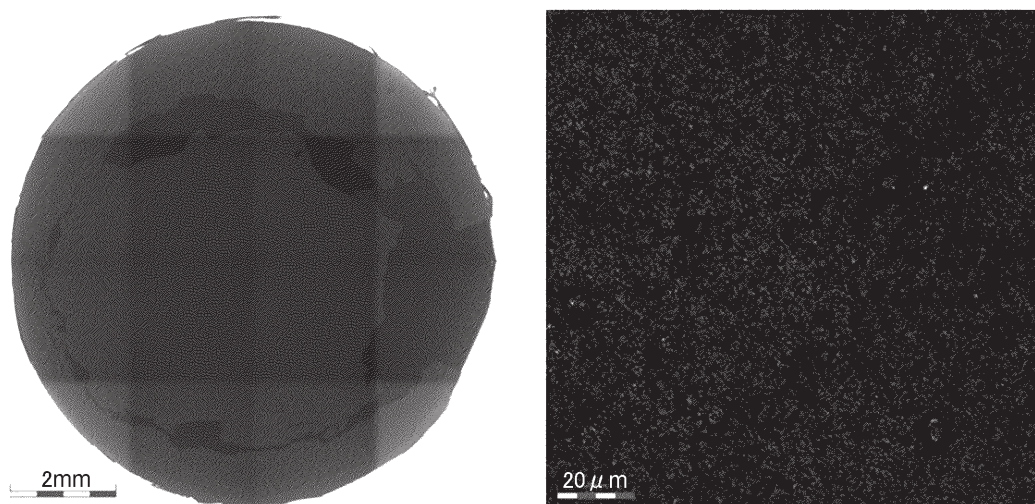


FIG.3

LASER MICROSCOPE IMAGE



RAMAN SPECTRUM

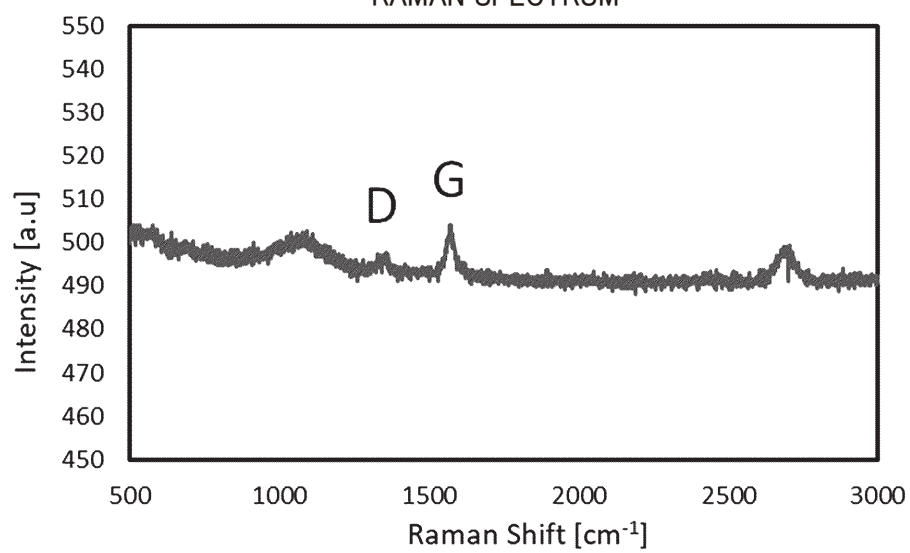
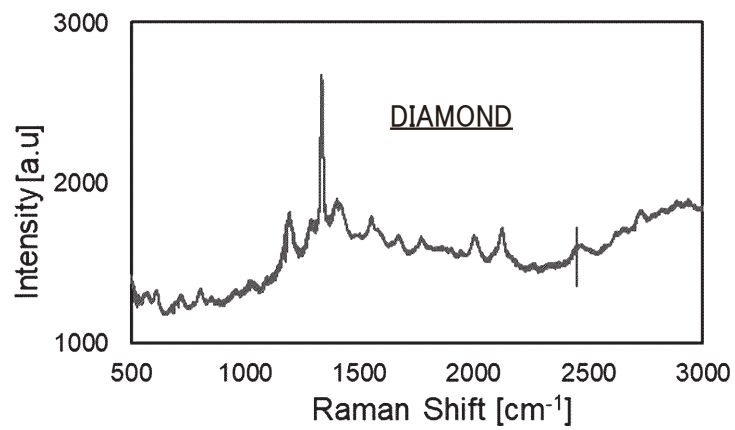
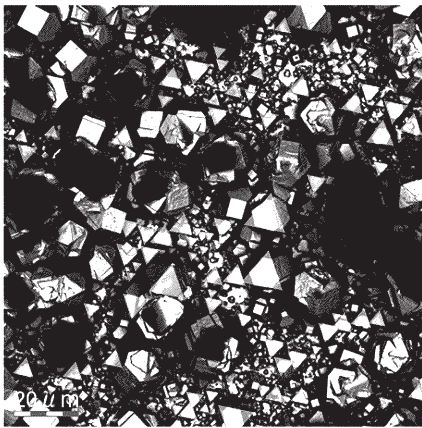
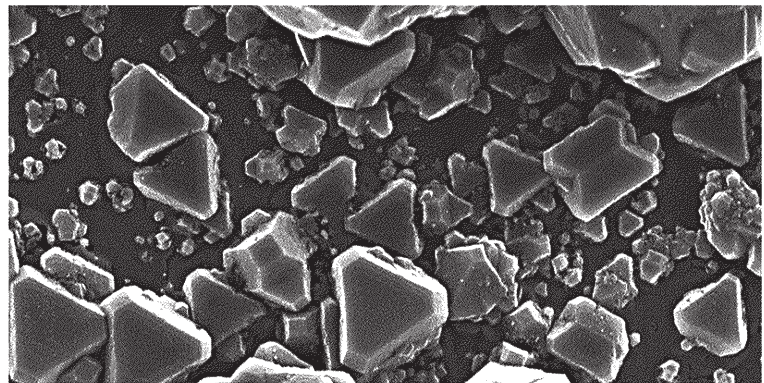


FIG.4



SEM IMAGE

LASER MICROSCOPE IMAGE

HIGH IN-PLANE ORIENTATION OF
(111) PARTICLES

15.0kV ×1,500 10μm WD11mm

FIG.5

	LATTICE CONSTANT (nm)(20°C)	THERMAL EXPANSION COEFFICIENT [$\times 10^{-6}(1/K)$]	MISMATCH WITH DIAMOND (%)[20°C]	MISMATCH WITH DIAMOND (%)[1000°C]
DIAMOND	0.357	1.1	—	— (0.357)
Si	0.543	2.4	−34.2	−34.3 (0.544)
Ir	0.384	6.5	−7.0	−7.5 (0.386)
Ni	0.352	12.8	+1.4	+0.3 (0.356)