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Understanding the Thermal Decomposition Mechanism at Diamond-Silica Interfaces Induced by Localized Laser Vitrification: experimental and *ab-initio* approach

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1. Diamond materials applied for vitrification processes

Table S1. Parameters of nanodiamond/SiO₂ samples for TGA/DSC analysis.

Name	Type of suspension	Volume of suspension	Mass of diamond	Mass of SiO ₂ powder	Final concentration (mg of NDs per 1 g of SiO ₂)
NV 0.1_10	Aqueous suspension of NDNV140nmHi (0.1 mg/mL)	100 µL	10 µg	1 g	0.010
NV 0.3_10		300 µL	30 µg		0.030
NV 0.5_10		500 µL	50 µg		0.050
NV 0.75_10		750 µL	75 µg		0.075
NV 1_10		1 mL	0.1 mg		0.1
MSY 0.1_10	Aqueous suspension of MSY 0-0.25 micron (0.05 mg/mL)	200 µL	10 µg		0.010
MSY 0.25_10		500 µL	25 µg		0.025
MSY 0.5_10		1 mL	50 µg		0.050
MSY 0.75_10		1.5 mL	75 µg		0.075
MSY 1_10		2 mL	0.1 mg		0.1

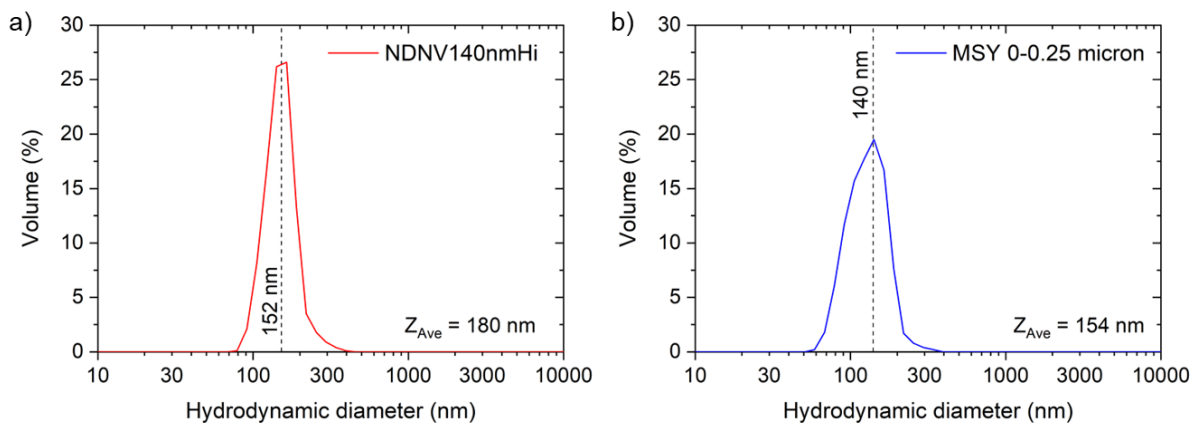


Fig. S1. Volume-weighted particle size distributions of *NDNV140nmHi* (a) and *MSY 0-0.25 micron* (b) particles suspended in ethanol.

2. Structural studies of diamond in silica glass samples cross-sections

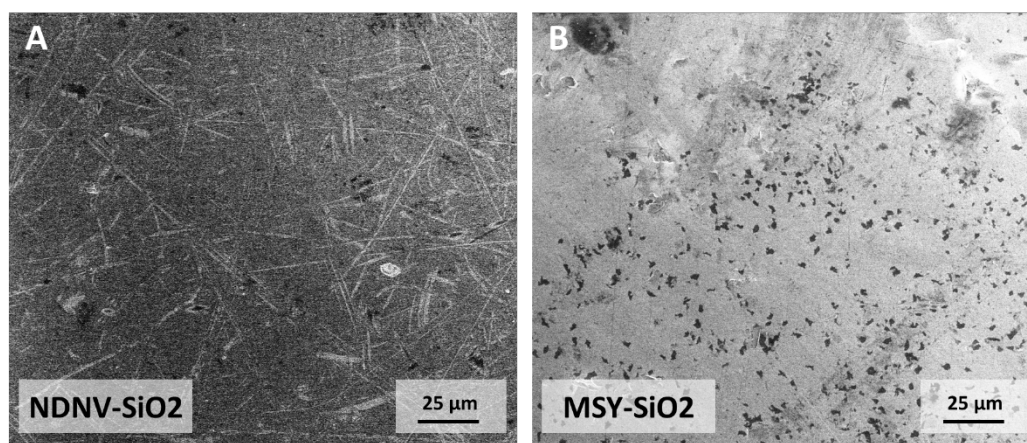


Fig. S2. SEM micrographs of diamond-silica glass samples fabricated during the vitrification process.

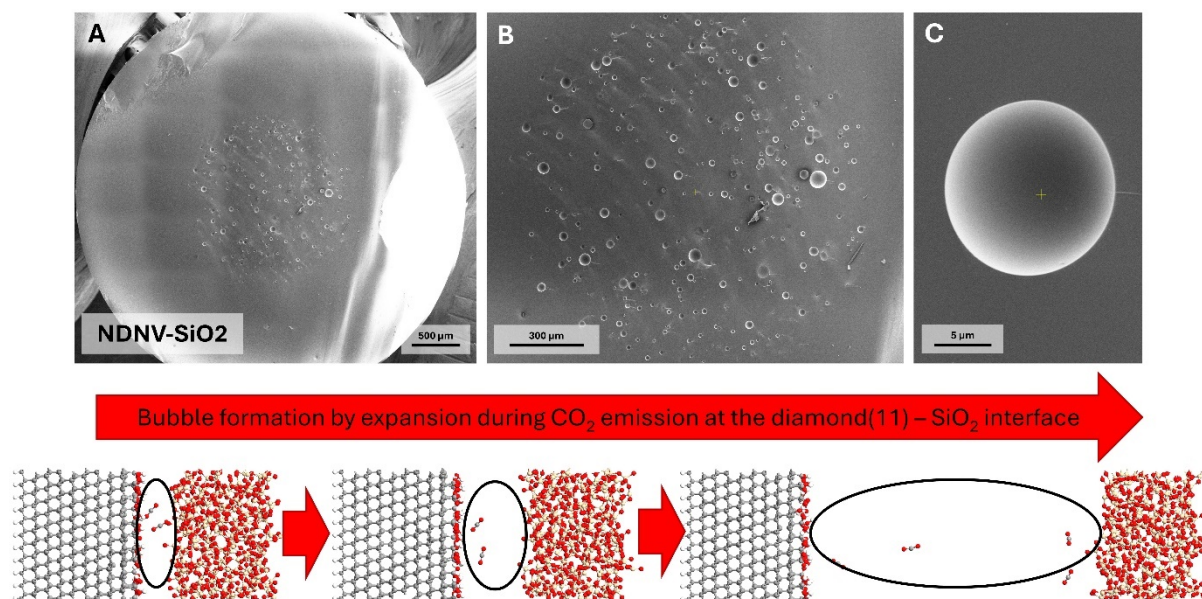


Fig. S3. SEM micrographs of diamond-silica glass samples fabricated during the vitrification process.

3. Raman studies of diamond in silica glass samples cross-sections

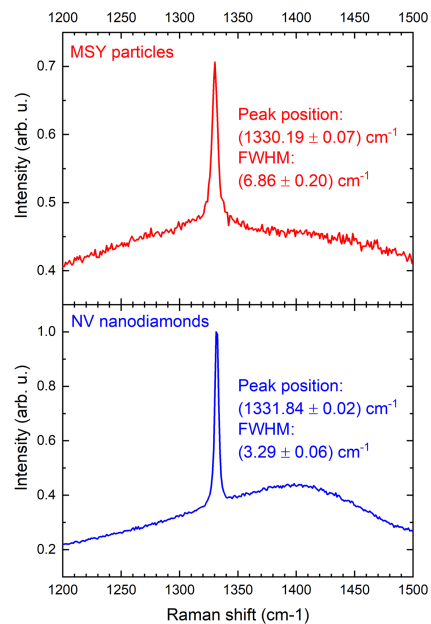


Fig. S4. Raman spectra of MSY particles and NDNV nanodiamonds measured under 785 nm laser excitation.