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Text S1

Tables S1 to S6

Text S1.

Data repository

We collated here all the data used for the paper from the samples (Table S1), grain size and componentry (Table S2), particle measurements (Table S3), geochemistry (Table S4), mineral composition (Table S5a), plagioclase rim and glass compositions (Table S5b) and plagioclase core and bulk composition (Table S5c) and Melt Inclusions (Table S6). The Tables are in Excel format in the zip-file. Below are the captions for the Tables

Table S1 List of the samples of the 2014 June eruption at PdF. Code= sample name; occurred= date of the event; collected= date of the collection of the sample; texture/size= type of clast (e.g. pyroclast versus lava) and its size (e.g., bomb, lapilli, ash); note on sample= to specify the sample conditions (e.g. water quenched or the temperature); note on location (e.g. base or top of a log); longitude (UTM); latitude (UTM); El = elevation (the quote of the sample site); TS = thin section (if a thin section was made); analyses= all the analyses performed on the samples (see the methodology section); Maj= major elements determination; trace = trace elements determination; isot = isotope determination; glass= glass chemistry; cry = crystal chemistry; Gr-s=grain size of the deposit; Com = componentry of the deposit; Mor= morphology of the particle; Dens = density of the particle; Con = connectivity; Per= permeability of the particle; Text = vesicle and/or crystal textures; MI= melt inclusion. 2

Table S2 Grain size of the deposits of June 2014 eruption at PdF. Sample = sample name; analysis = the analysis performed on the sample; type = (e.g. whole deposit versus scattered deposits) and type of particle; Phi unit = $-\log_{10} d$ (where d = grain diameter in millimeters.); percentile = represents the size at 5, 16 etc percent of the sample by weight

Table S3 Bulk parameters of the particles from the 2014 June eruption at PdF. Particle name = name of the particle; Type = type of particle; a(axe) = major axe of the particle; b(axe) = intermediate axe of the particle; c(axe) = minor axe of the particle; Weight = weight of the particle; Density = measured density of the particle; Por = density derived porosity of the particle; V(Pyc) = volume of the particle measured with the Pycnometer; SD = standard deviation on 5 volume measurements with the pycnometer; Conn = percentage of connected vesicles in the particle; Cry = percentage of total crystals corrected for the vesicularity, calculated in 3D (Higgins 2000); Mplg = percentage of mesocrysts of plagioclase; Σ plg = percentage of microcrysts of plagioclase; Mcpx = percentage of mesocrysts of pyroxene; Σ cpx = percentage of microcrysts of pyroxene; k0 = Apparent permeability from simple Darcy law; k1 = Viscous permeability from Reynolds and Forchheimer equations k2 = Inerzial permeability from Reynolds and Forchheimer equations

Table S4 Major and trace element concentrations of whole-rocks and hand-picked glass from the June 2014 eruption of Piton de la Fournaise

Table S5a Mineralogy compositions of crystals in different types of particles (golden pumice, and fluidal, spiny glassy and spiny opaque scoria), from the Main Vent and the Western and Upper Fractures sites of the June 2014 eruption

Table S5b Plagioclase rim and glass compositions in different types of particles (golden pumice, and fluidal, spiny glassy and spiny opaque scoria), from the Main Vent and the Western and Upper Fractures sites of the June 2014 eruption. Other eruptions from PdF are reported for comparison (April 2007; September 2008; November 2008; December 2008; December 2009; January 2010).

Table S5c Plagioclase core and bulk compositions different types of particles (golden pumice, and fluidal, spiny glassy and spiny opaque scoria), from the Main Vent and the Western and Upper Fractures sites of the June 2014 eruption. Other eruptions from PdF are reported for comparison (April 2007; September 2008; November 2008; December 2008; December 2009; January 2010).

Table S6 Melt inclusion analyses performed in the mesocrystal of olivine from the three groups of scoriae (fluidal, spiny glassy and spiny opaque) of the 2014 eruption at Piton de la Fournaise picked up from the sample of chosen lapilli (REU141118-5, in Table S1) collected at the Main Vent.