



Supplement of

TEM analysis of the internal structures and mineralogy of Asian dust particles and the implications for optical modeling

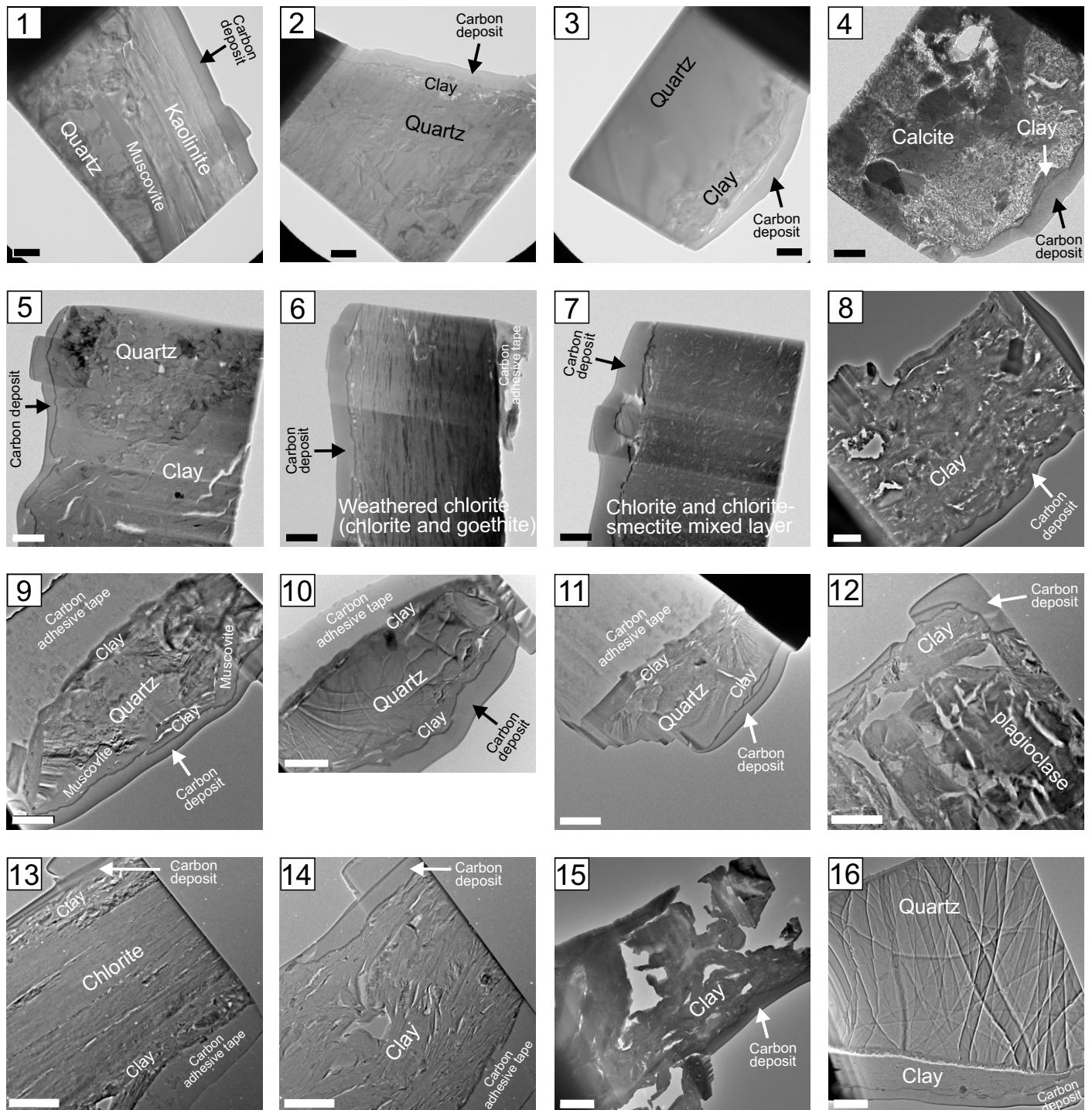
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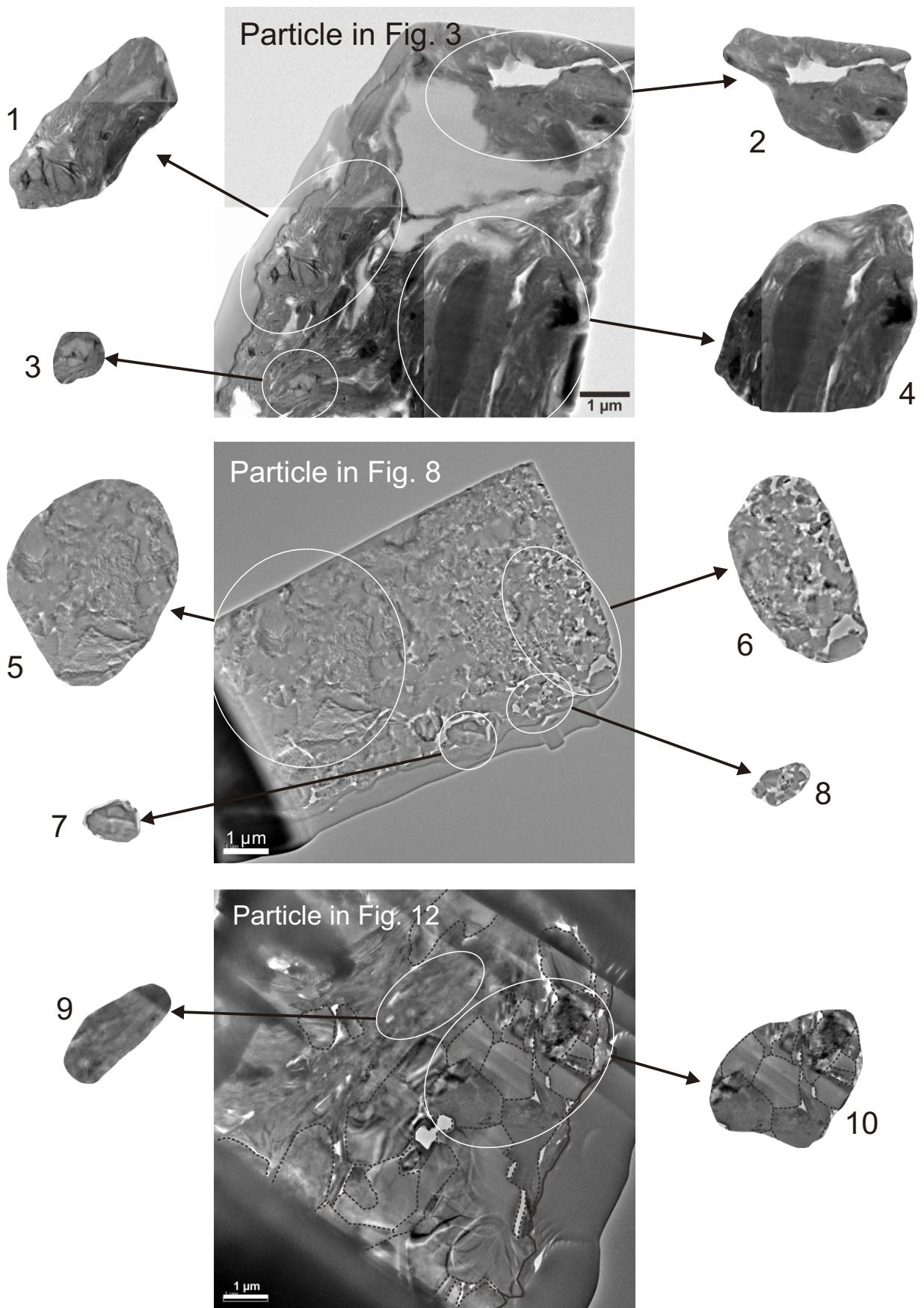
Supplementary Table 1. General chemical formulas of minerals in the Asian dusts identified by TEM analysis.

Mineral	Chemical formula
Phyllosilicates	
Illite*	K _{0.8} (Al,Fe,Mg) ₂ (Si _{3.5} Al _{0.5})O ₁₀ (OH) ₂
Smectite*	Ca _{0.1-0.3} (Al,Mg,Fe) ₂ (Si ₃₋₄ Al ₀₋₁)O ₁₀ (OH) ₂ ·nH ₂ O
Vermiculite*	Ca _{0.3-0.5} (Mg,Fe,Al) ₃ (Si ₃ Al)O ₁₀ (OH) ₂ ·nH ₂ O
Chlorite*	(Mg,Fe,Al) ₆ (Si ₃ Al)O ₁₀ (OH) ₈
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄
Muscovite	KAl ₂ (Si ₃ Al)O ₁₀ (OH) ₂
Biotite*	K(Fe,Mg,Al) ₃ (Si ₃ Al)O ₁₀ (OH) ₂
Other silicates	
Quartz	SiO ₂
Plagioclase*	(Ca,Na)Al ₁₋₂ Si ₂₋₃ O ₈
K-feldspar	KAlSi ₃ O ₈
Amphibole*	Ca ₂ (Fe,Mg) ₅ AlSi ₇ O ₂₂ (OH) ₂
Epidote	Ca ₂ (Al,Fe) ₃ (SiO ₄) ₃ (OH)
Non-silicates	
Calcite	CaCO ₃
Goethite	FeO(OH)
Magnetite	Fe ²⁺ Fe ³⁺ ₂ O ₄
Hematite	Fe ₂ O ₃

*Representative chemical formulas. They have a range of compositional variation due to ionic substitution.



Suppl. Fig. 1. Low magnification TEM images of 14 cross-sectional slices not discussed in the text (1–14). Slice 15 and 16 were included in Jeong et al. (2014). Scale bar = 1 μ m. FIB milling was carried out for individual dust particle attached on the conductive carbon adhesive tape after carbon deposition.



Suppl. Fig. 2. Small particles derived from large particles may have internal structures of (1) preferentially oriented clay agglomerate with quartz inclusion, (2) randomly-oriented porous clay agglomerate, (3) quartz core coated with clays, (4) preferentially oriented clay agglomerate with chlorite inclusion, (5) compact calcite polycrystal, (6, 8) porous calcite polycrystals, (7) calcite single crystal, (9) biotite plate, and (10) polymimetic polycrystal with pores.