



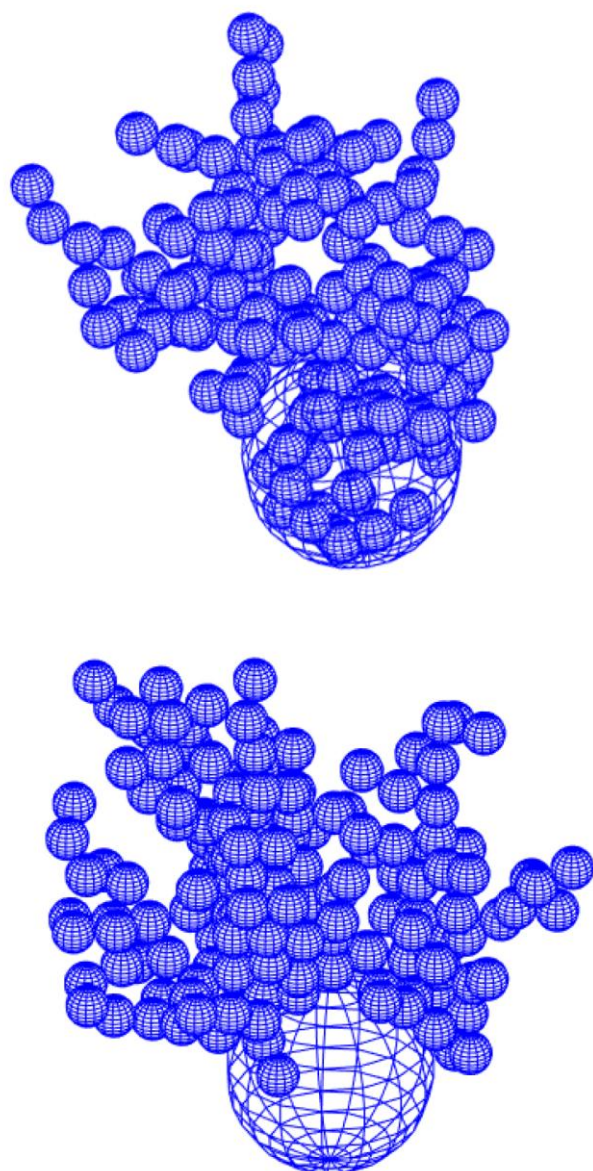
Supplement of

Variation of the radiative properties during black carbon aging: theoretical and experimental intercomparison

C. He et al.

Correspondence to: C. He (cenlinhe@atmos.ucla.edu)

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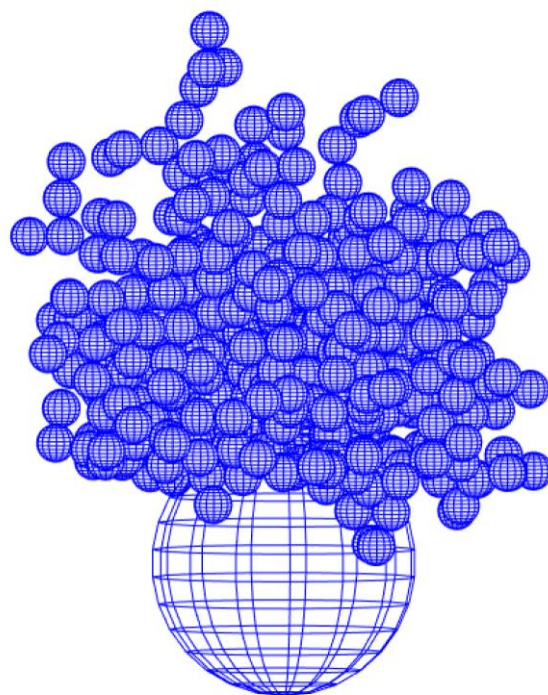
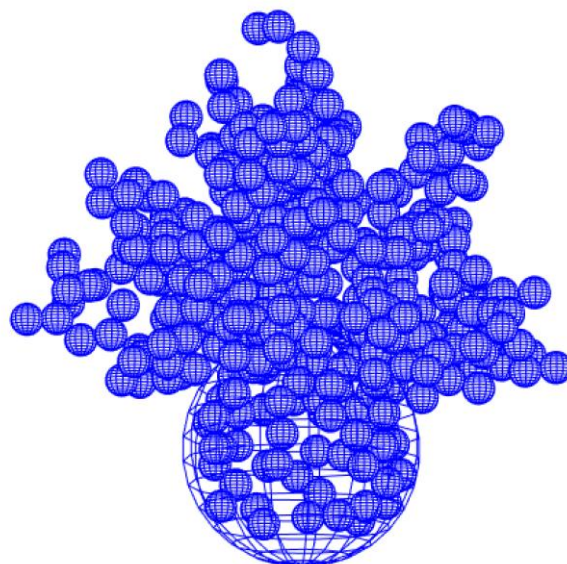


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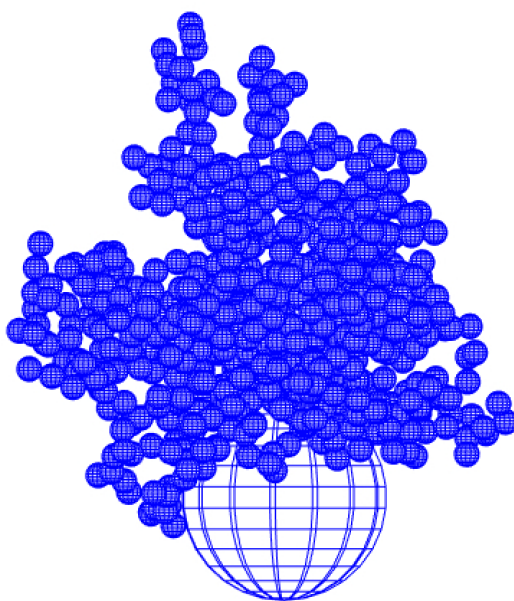
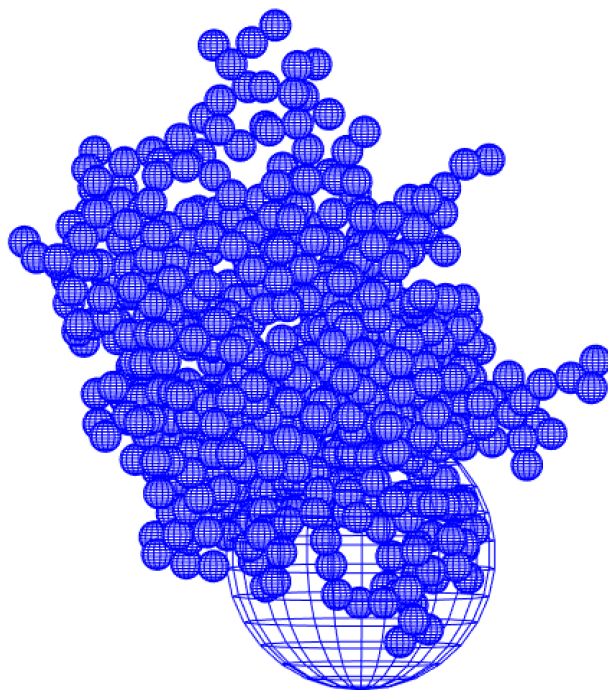
21 **Figure S1.** The partially encapsulated (top) and externally attached (bottom) coating structures
22 generated by the stochastic procedure used in this study for BC mobility diameter of 155 nm at
23 aging Stage II (i.e., coated by sulfuric acid (H_2SO_4)). The total number of BC primary spherules
24 in each structure is 164, with a diameter of 15 nm for each primary spherule. 30 BC primary
25 spherules are inside the H_2SO_4 sphere in the partially encapsulated structure. The diameters of
26 H_2SO_4 sphere are 79 nm and 73 nm in the partially encapsulated and externally attached
27 structures, respectively.

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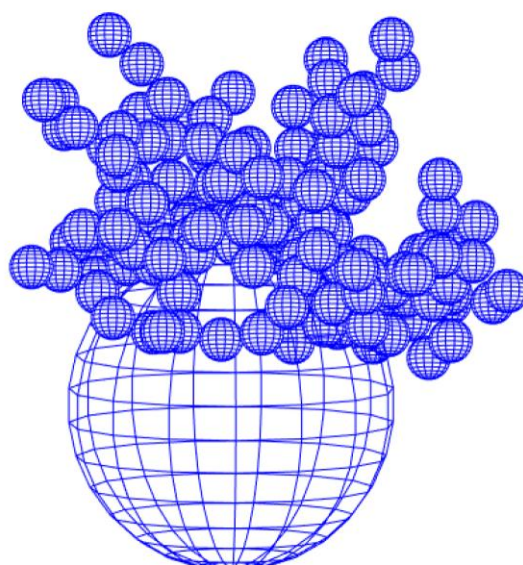
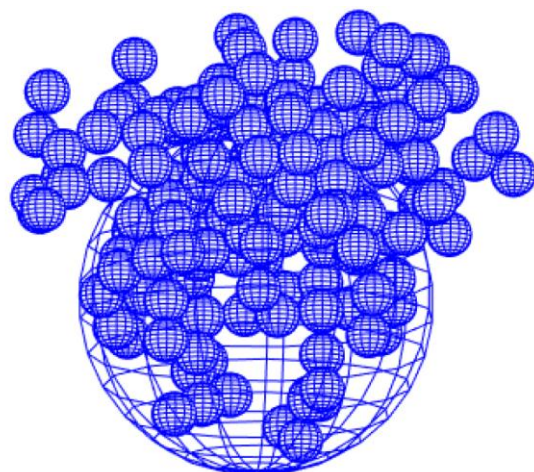
Figure S2. Same as Fig. S1, but for BC mobility diameter of 245 nm. The total number of BC primary spherules in each structure is 416. 60 BC primary spherules are inside the H₂SO₄ sphere in the partially encapsulated structure. The diameters of H₂SO₄ sphere are 111 nm and 105 nm in the partially encapsulated and externally attached structures, respectively.



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38 **Figure S3.** Same as Fig. S1, but for BC mobility diameter of 320 nm. The total number of BC
39 primary spherules in each structure is 651. 80 BC primary spherules are inside the H₂SO₄ sphere
40 in the partially encapsulated structure. The diameters of H₂SO₄ sphere are 130 nm and 124 nm in
41 the partially encapsulated and externally attached structures, respectively.

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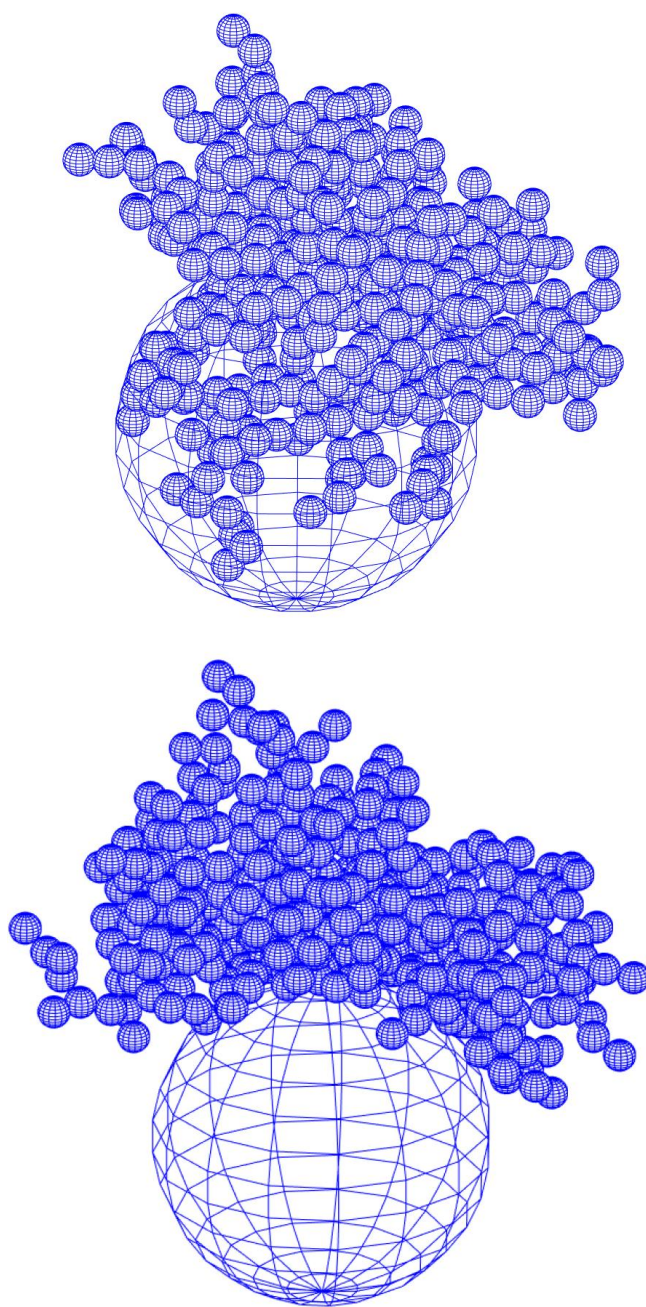
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46 **Figure S4.** Same as Fig. S1, but for aging Stage III (i.e., coated by sulfuric acid and water
47 ($\text{H}_2\text{SO}_4\text{-H}_2\text{O}$)). The total number of BC primary spherules in each structure is 164. 75 BC
48 primary spherules are inside the $\text{H}_2\text{SO}_4\text{-H}_2\text{O}$ sphere in the partially encapsulated structure. The
49 diameters of $\text{H}_2\text{SO}_4\text{-H}_2\text{O}$ sphere are 119.4 nm and 113.2 nm in the partially encapsulated and
50 externally attached structures, respectively.

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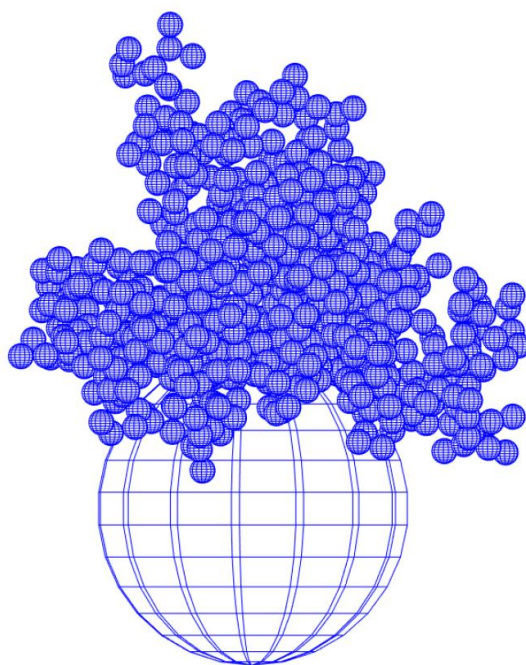
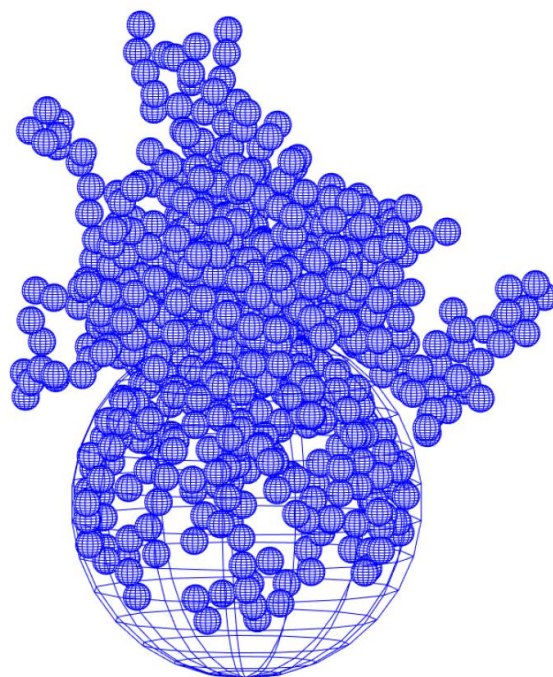
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55 **Figure S5.** Same as Fig. S4, but for BC mobility diameter of 245 nm. The total number of BC
56 primary spherules in each structure is 416. 125 BC primary spherules are inside the H₂SO₄-H₂O
57 sphere in the partially encapsulated structure. The diameters of H₂SO₄-H₂O sphere are 163.6 nm
58 and 158.2 nm in the partially encapsulated and externally attached structures, respectively.

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63 **Figure S6.** Same as Fig. S4, but for BC mobility diameter of 320 nm. The total number of BC
64 primary spherules in each structure is 651. 200 BC primary spherules are inside the H₂SO₄-H₂O
65 sphere in the partially encapsulated structure. The diameters of H₂SO₄-H₂O sphere are 192.2 nm
66 and 185.8 nm in the partially encapsulated and externally attached structures, respectively.