



Supplement of

Unveiling the organic contribution to the initial particle growth in 3–10 nm size range

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Table S1. Summary of experimental conditions. Exp. A-F is a series of groups conducted under specific RH (20%, 40%, 60% and 80%). Exp. A represents the pure inorganic groups in the presence of SO₂ and Exp. B represents the pure organic groups in the presence of α -pinene. Exp. C-F are mixture groups containing both SO₂ and α -pinene with different concentration ratio. [SO₂] and [α -pinene] represent the concentration of SO₂ and α -pinene.

RH (%)	Group No. (Exp.)	Experiments	[SO ₂] (ppbv)	[α -pinene] (ppbv)	[α -pinene]/[SO ₂]
20	A	SO ₂	~503	0	0
	B	α -pinene	0	~1960	∞
	C	SO ₂ / α -pinene	~503	~50	0.1
	D	SO ₂ / α -pinene	~503	~99	0.2
	E	SO ₂ / α -pinene	~503	~249	0.5
	F	SO ₂ / α -pinene	~503	~497	1
40	A	SO ₂	~217	0	0
	B	α -pinene	0	~1162	∞
	C	SO ₂ / α -pinene	~217	~22	0.1
	D	SO ₂ / α -pinene	~217	~43	0.2
	E	SO ₂ / α -pinene	~217	~109	0.5
	F	SO ₂ / α -pinene	~217	~215	1
60	A	SO ₂	~169	0	0
	B	α -pinene	0	~733	∞
	C	SO ₂ / α -pinene	~169	~17	0.1
	D	SO ₂ / α -pinene	~169	~35	0.2
	E	SO ₂ / α -pinene	~169	~85	0.5
	F	SO ₂ / α -pinene	~169	~174	1
80	A	SO ₂	~96	0	0
	B	α -pinene	0	~450	∞
	C	SO ₂ / α -pinene	~96	~10	0.1
	D	SO ₂ / α -pinene	~96	~20	0.2
	E	SO ₂ / α -pinene	~96	~48	0.5
	F	SO ₂ / α -pinene	~96	~95	1

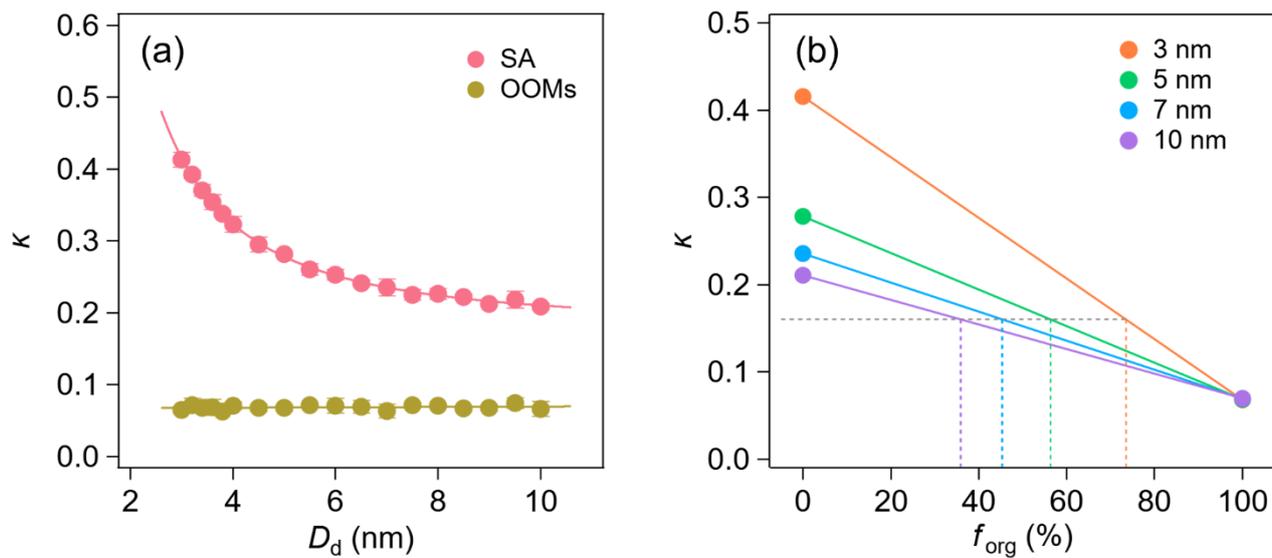


Figure S1. (a) The measured κ values of pure organic (OOMs) and inorganic (SA) under RH=20%. (b) Size-resolved κ - f_{org} linear relationships (solid lines), taking 3, 5, 7, and 10 nm as examples. The grey dashed line represents the measured κ of SA-OOMs particles. The colored dashed lines represent the derived f_{org} .

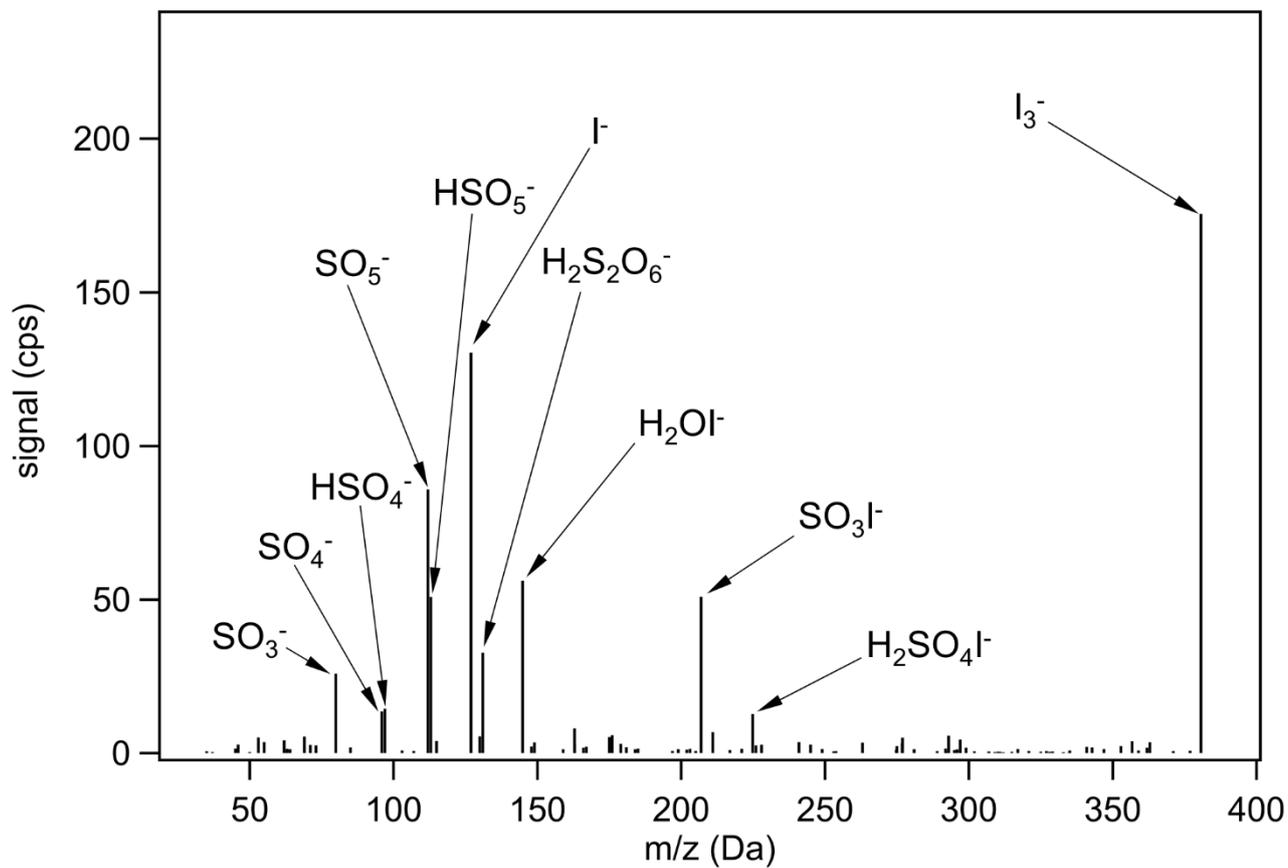


Figure S2. Representative Vocus AIM negative ion mass spectra of the oxidation products of SO₂.