

Table S1. List of cruises reporting iodine distribution in aerosol size fractions or aerosol iodine speciation ^a

#	Program / Campaign ^a	Cruise	Location	Min lon	Max lon	Min lat	Max lat	Date start	Date end	N	Type of data	Methods ^b	Ref.
C3	Polarstern Campaigns	ANT-VII/5 (PS14), R/V Polarstern	Tropical Atlantic	-1	2	-11	-6	18-03-89	18-03-89	1	I ⁻ , IO ₃ ⁻ (bulk)	IDMS <i>Stirring</i>	(Wimschneider & Heumann, 1995)
C4	German SOLAS	M55, R/V Meteor	Tropical Atlantic	-56.2	-3.5	0.1	11.3	15-10-02	13-11-02	28	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI ⁺ ; V-SP; ICP-MS <i>5 min</i>	(Baker, 2005)
C5	CHINARE	2 nd CHINARE R/V Xue-long	Western Pacific-Artic Ocean	121	-150	35.0	80.0	15-07-03	26-09-03	44	TI, TSI, SOI, I ⁻ , IO ₃ ⁻ (bulk)	IC-ICP-MS <i>5 min</i>	(Kang et al., 2015)
C6	AMT	AMT13 RRS James Clark Ross	Atlantic Transect	-40.2	-14.3	-41.1	47.3	14-09-03	08-10-03	22	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI ⁺ ; V-SP; ICP-MS <i>5 min</i>	(Baker, 2005)
C7	CAC	23 rd CAC R/V Xue-Long	Western Pacific-Indian-Southern Ocean	70.8	122.0	-69.3	26.2	20-11-05	22-03-06	57	TI, TSI, SOI, I ⁻ , IO ₃ ⁻ (bulk)	IC-ICP-MS <i>20 min</i>	(Lai et al., 2008)
C8	MAP	CEC, R/V Celtic Explorer	North Atlantic	-12.3	-7.5	50.7	57.4	12-06-06	05-07-06	33	TSI, SOI, I ⁻ , IO ₃ ⁻ (PM _{2.5})	VI; IC-ICP-MS <i>20 min</i>	(Gilfedder et al., 2008; Lai, 2008)
C9	OOMPH	VT 88 R/V Marion Dufresne	Southern Atlantic	-59.2	15.8	-44.9	-33.7	20-01-07	02-02-07	14	TSI, SOI, I ⁻ , IO ₃ ⁻ (PM _{2.5})	IC-ICP-MS <i>20 min</i>	(Lai et al., 2011)
C10	RHaMBLe	RRS Discovery D319	East Tropical Atlantic	-23.1	-14.1	16.6	33.3	22-05-07	05-06-07	14	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI ⁺ ; V-SP ICP-MS <i>5 min</i>	(Allan et al., 2009)
C11	UK-SOLAS	INSPIRE RRS Discovery D325	Eastern Tropical North Atlantic	-25.0	-22.8	16.0	26.0	17-11-07	16-12-07	17	TI, TSI (bulk)	TESI	(Gilfedder et al., 2010; Sherwen et al., 2016)

C12		RRS James Cook Cruise 18 (JC18)	Tropical Atlantic	-63	-62.5	16.2	16.7	04-12-07	14-12-07	8	TI, TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI [*] ; IC-ICP-MS <i>5 min</i>	This work
C13	CHINARE	3 rd CHINARE, R/V Xue-long	Western Pacific-Artic Ocean	122	-146	31.2	85.1	13-07-08	21-09-08	28	TI, TSI, SOI, I ⁻ , IO ₃ ⁻ (bulk)	CI [*] ; IC-ICP-MS <i>5 min</i>	(Xu et al., 2010)
C14	TransBrom	R/V Sonne SO202-2	Tropical Western Pacific	143.7	154.5	-14.6	36.0	10-10-09	22-10-09	13	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI [*] ; IC-ICP-MS <i>Shaking</i>	(Yodle, 2015)
C17	AMT	AMT21 RRS Discovery D371	Atlantic Transect	-51.0	-16.4	-45.1	48.2	01-10-11	07-11-11	33	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI [*] ; IC-ICP-MS <i>Shaking</i>	(Baker & Yodle, 2021)
C18	SHIVA	R/V Sonne SO218	Tropical Western Pacific	106.9	120.7	2.2	13.1	16-11-11	28-11-11	11	TSI, SOI, I ⁻ , IO ₃ ⁻ (bulk)	IC-ICP-MS <i>Shaking</i>	(Yodle & Baker, 2019)
C19	OASIS	R/V Sonne SO 234-2 and SO235	Tropical Indian Ocean	35.0	72.0	-29.8	1.7	08-07-14	07-08-14	10	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI [*] ; IC-ICP-MS <i>Shaking</i>	(Droste, 2017; Droste et al., 2021)
C20		M138, R/V Meteor	Eastern Tropical and Equatorial Pacific	-85.8	-78.1	-10.7	-1.8	06-06-17	28-06-17	12	TSI, SOI, I ⁻ , IO ₃ ⁻ (fine + coarse)	CI [*] ; IC-ICP-MS <i>Shaking</i>	(Droste et al., 2021)

^a Abbreviations: SOLAS: Surface-Ocean / Lower Atmosphere Study; AMT: Atlantic Meridional Transect; CHINARE: China National Arctic Research Expedition; CAC: China Antarctic Campaign; MAP: Marine Aerosol Production from Natural Sources; OOMPH: Organics over the Ocean Modifying Particles in both Hemispheres; RHAMBLE: Reactive Halogens in the Marine Boundary Layer; SHIVA: Stratospheric Ozone: Halogen Impacts in a Varying Atmosphere; OASIS: Organic very short lived substances and their Air Sea Exchange from the Indian Ocean to the Stratosphere. ^b The numbers in italics indicate the ultrasonic agitation time during extraction in speciation measurements, alternative extraction methods are also indicated in italics; CI: Cascade Impactor; VI: Virtual Impactor; INAA: Instrumental Neutron Activation Analysis; V-SP: Voltammetry-Spectrophotometry; IC: Ion Chromatography; ICP-MS: Inductively Coupled Plasma – Mass Spectrometry; IDMS: Isotope Dilution Mass Spectrometry; TESI: Thermal extraction with spectrometric detection. * Cascade impactors were also used to achieve the coarse/fine separation, but they weren't used to achieve detailed size segregation.

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