	SALSA2.0	M7
Microphysical process		
Nucleation	activation type nucleation (Sihto et al., 2006)	neutral and charged nucleation of H_2SO_4 and H_2O (Kazil and Lovejoy, 2007)
Condensation of H_2SO_4	analytical predictor of condensation solved simultaneously with nucleation (Jacobson, 2005)	two-step operator splitting scheme with an analytical solution for production and condensation (Kokkola et al., 2009)
Coagulation	semi-implicit method (Jacobson and Turco, 1995)	implicit method (Vignati et al., 2004)
Hydration	Zdanowskii–Stokes–Robinson (ZSR) relation method (Stokes and Robinson, 1966)	κ-Köhler (Petters and Kreidenweis, 2007)
Emissions		
Sea salt	Size-segregated sea salt emissions from Long et al. (2011) parameterization mapped to the soluble size sections in subrange 2 following the M7 mode parameters for accumulation and coarse modes.	Size-segregated sea salt emissions from Long et al. (2011) parameterization mapped to the soluble accumulation and coarse modes
Mineral dust	Size-segregated mineral dust emissions from Cheng et al. (2008) parameterization mapped to the insoluble size sections in subrange 2 following the M7 mode parameters for accumulation and coarse modes.	Size-segregated mineral dust emissions from Cheng et al. (2008) parameterization mapped to insoluble accumulation and coarse modes
Radiative effects	Lookup tables which are based on Mie calculations for the extinction cross section, asymmetry factor, and single scattering albedo as a function of Mie size parameter and refractive index. Size sections are assumed to have a "flat top" size distribution within bins.	Lookup tables which are based on Mie calculations for the extinction cross section, asymmetry factor, and single scattering albedo as a function of Mie size parameter and refractive index. Lookup tables have been precalculated separately for modes with geometric standard deviations of 1.59 and 2.0.
Below- and in-cloud scavenging	Prescribed scavenging coefficients for each size section according to Bergman et al. (2012)	Prescribed impaction scavenging coefficients for each mode according to Stier et al. (2005) or size-dependent scavenging rates according to Croft et al. (2009, 2010).