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14C measurements in suburban aerosols from northern Japan: An enhanced production of biogenic organic aerosols in spring

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Here, we report the year-round observation of fossil and modern carbon in total carbon (TC) and water-soluble organic carbon (WSOC) in atmospheric aerosols from Sapporo, northern Japan, based on radiocarbon measurements. We found that modern carbons are more important in both TC and WSOC, except for wintertime, with elevated levels in spring. Interestingly, WSOC showed higher percent modern carbon (pMC) throughout the year, suggesting that WSOC is produced by photochemical oxidation of biogenic volatile organic compounds especially during spring to summer.

Keywords: aerosols, radiocarbon, total carbon, water-soluble organic carbon