C203-P002 **Room: Poster Session Hall** **Time: May 26**

Mass-independently fractionation of oxygen ion O+ in thermosphere

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In 2006, Ireland et al. reported that Mass-independent fractionation (MIF) of oxygen (Delta^{17}O is about 25 permil) in the metallic particles on the lunar surface. Ozima et al. (2007) suggested that these extraordinary ratios are attributable to terrestrial oxygen that was transported from the thermosphere by Earth Wind.

The purpose of this study is to investigate the MIF mechanism of O^+ ion with the ion chemistry in thermosphere by the theoretical calculation. The 1-dimension photochemical model in thermosphere, developed by Hiraki et al. (2008), used for the calculation. An altitude range is 100-800 km, 60 sets of chemical reactions with 21 molecular species, atoms, these ions and electrons are included.

According to Seta et al. (2008), we focus the following three reactions.

Q^+ + $^{16}O^{16}O$ - $^{16}O^{16}O^+$ + Q 1)

Q = ^{16}O, ^{17}O, ^{18}O. Reaction rates are k_{16}, k_{17}, and k_{18} for ^{16}O, ^{17}O, and ^{18}O, respectively.

$^{16}O^+$ + ^{16}OQ - $^{16}OQ^+$ + ^{16}O 2)

Reaction rates are k'_{16}, k'_{17}, k'_{18} respectively.

$^{16}O^+$ + ^{16}OQ - $^{16}O^{16}O^+$ + Q 3)

Reaction rates are k''_{16}, k''_{17}, k''_{18} respectively.

The MIF Delta$^{17}O^+$ shows about 25 permil at the altitude 340 km for the case k_i/k_{16}=0.9 (i=17, 18) for reaction 1), k'_i/k'_{16}=0.9 for reaction 2), and k''_i/k''_{16}=0.9 for reaction 3).