The infrared spectra of iron oxides particles II
-------In the case of wustite

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The mysterious 21 μm emission feature seen in C-rich proto-planetary nebulae remains unidentified since its discovery in 1989 (Kwok, Volk and Hrivnak, 1989), and the candidate carriers have long been the subject of discussion.

Among many carrier candidates, the calculated spectra of FeO nano particles closely matched the observed 21 μm emission features and seems to be a viable candidate (Zhang et al. 2009). As for the calculated 21 μm spectra of FeO (wustite), the optical constants were derived with the reflectance of synthesized FeO bulk (Begemann et al. 1995, Henning and Mutschke 1997). But, the peak position of the measured spectra of FeO particles in another labs shifted to longer wavelength than 21 μm.

We measured infrared spectra of wustite of commercial samples and synthesized sample by chemical reaction in laboratory, and found the peak shifted from sample to sample. Further, we synthesized wustite in laboratory with another method, and compared these spectra.

We will discuss about difference of spectra among wustite samples and those crystal structure connected defects. As FeO (wustite) is non-stoichiometric with some iron deficiency, the difference of infrared spectra among wustite samples may be due to some iron deficiency. Further, we will discuss about 21 μm emission feature compared with the results of the present iron oxide particles.