MINERALOGICAL AND CHEMICAL VARIATIONS RECORDED IN DEHYDRATED CARBONACEOUS CHONDRITES. A. Nakato[1], T. Nakamura[1] and T. Noguchi[2]. [1]Kyushu University, Fukuoka, 812-8581, Japan. E-mail: ai-ko@geo.kyushu-u.ac.jp, [2]Ibaraki University, Ibaraki, 310-8512, Japan.

Dehydrated carbonaceous chondrites provide evidence for thermal evolution of primitive hydrous asteroids [e. g., 1]. It is important to understand mineralogical and chemical variations of carbonaceous chondrites that experienced dehydration, because the variation reflects diversity of the asteroids that underwent thermal metamorphism. For this purpose, various carbonaceous chondrites, Dhofar735, Yamato(Y)-86695, WIS91600, MAC88107, EET87522, and PCA91008, which were suggested to have been heated based mainly on reflected spectra [e.g., 2], were studied by synchrotron XRD and electron and Raman spectroscopy.

Fine-grained phyllosilicate-rich matrix is a sensitive indicator of heating. The degree of decomposition and dehydration of matrix phyllosilicates is estimated by XRD and compared with experimentally heated Murchison and naturally heated Belgica(B)-7904 [3]. The results are following: Murchison heated at 900°C = B-7904 > Dhofar735 = PCA91008 > Murchison heated at 600°C > MAC88107 > Y-86695 > EET87522 = WIS91600. The maturation glade of organics in matrix is estimated by micro-Raman spectroscopy as following: MAC88107 > Dhofar735 > B-7904 = Murchison heated at 900°C > PCA91008 > Murchison heated at 600°C > Y-86695 = WIS91600 = EET87522.

The six chondrites show a wide variation in overall textures, chemical composition of matrix, and the presence/absence of PCPs. Y-86695 and EET87522 are typical CMs, Dhofar735 is similar to B-7904 dehydrated CI/CM, and WIS91600 is similar to Tagish Lake chondrite. MAC88107 and PCA91008 are not similar to any hydrous carbonaceous chondrites.

Matrix serpentine in Y-86695 and EET87522 is decomposed but does not transform to secondary olivine. Therefore, the degree of heating of the two meteorites is lower than Murchison heated experimentally at 600°C/1h [3]. Matrix of Dhofar735 consists of decomposed saponite, serpentine, and PCPs, which is similar to B-7904. Like Tagish Lake, WIS91600 contains saponite and Mg-Fe carbonate, but shows depletion of interlayer water molecules in saponite and no other evidence of heating. Therefore, it experienced very weak heating. PCA91008 has been heated to form secondary silicates, but abundant jarosite formed in matrix due to heavy terrestrial weathering, which makes it difficult to clue original mineralogy. Phyllosilicate in chondrule-rims in MAC88107 decomposes and forms low-crystalline olivine. But the organics maturation grade is very high and corresponds to typical CO chondrite [5], suggesting long-duration low-temperature heating. This supports the classification of this meteorite to CM-CO clan [4]. All results taken together, the degree of heating and original mineralogy prior to heating vary greatly among six hydrous carbonaceous chondrites, thus suggesting that dehydrated primitive asteroids have a wide variation in mineralogy and organic chemistry.

References: [1] Hiroi T. et al. 1993. *Science* 261: 1016-1018. [2] Moroz L.V. et al. 2006. *MAPS* 41: 1123-1268 [3] Nakato A. et al. 2008. *Earth, Planets and Space* 60: 855-864 [4] Krot A.N. et al. 2000. *MAPS* 35: 1365-1386. [5] Busemann H. et al. 2007. *MA PS* 42: 1387-1416.