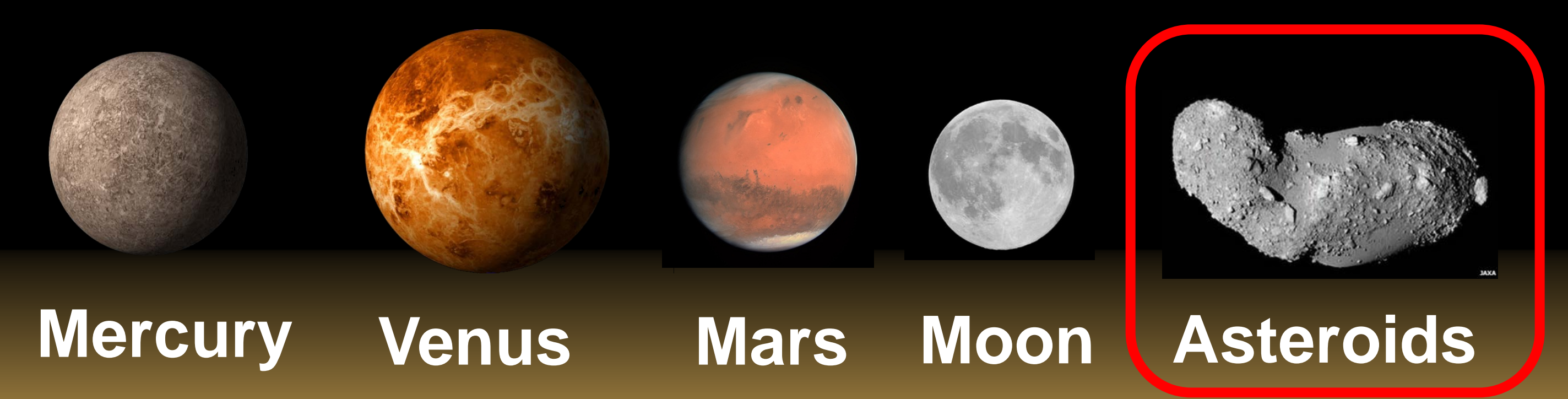
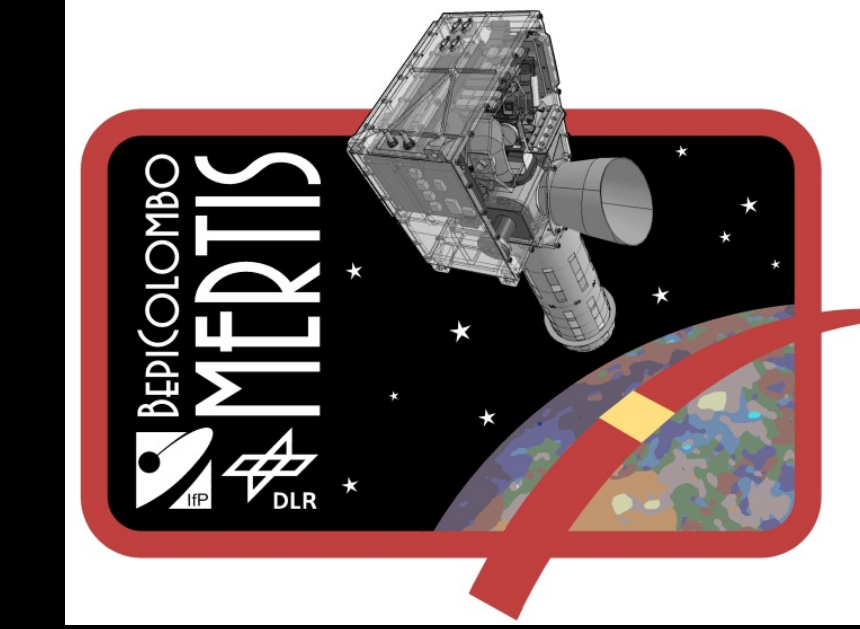


Emissivity Spectra of Meteoritic Powders mixed with Liquid Formamide (NH₂COH) at Different Temperatures

R. Saladino¹, A. Maturilli², J. Helbert², J.P. de Vera², M. D'Amore², S. Ferrari²

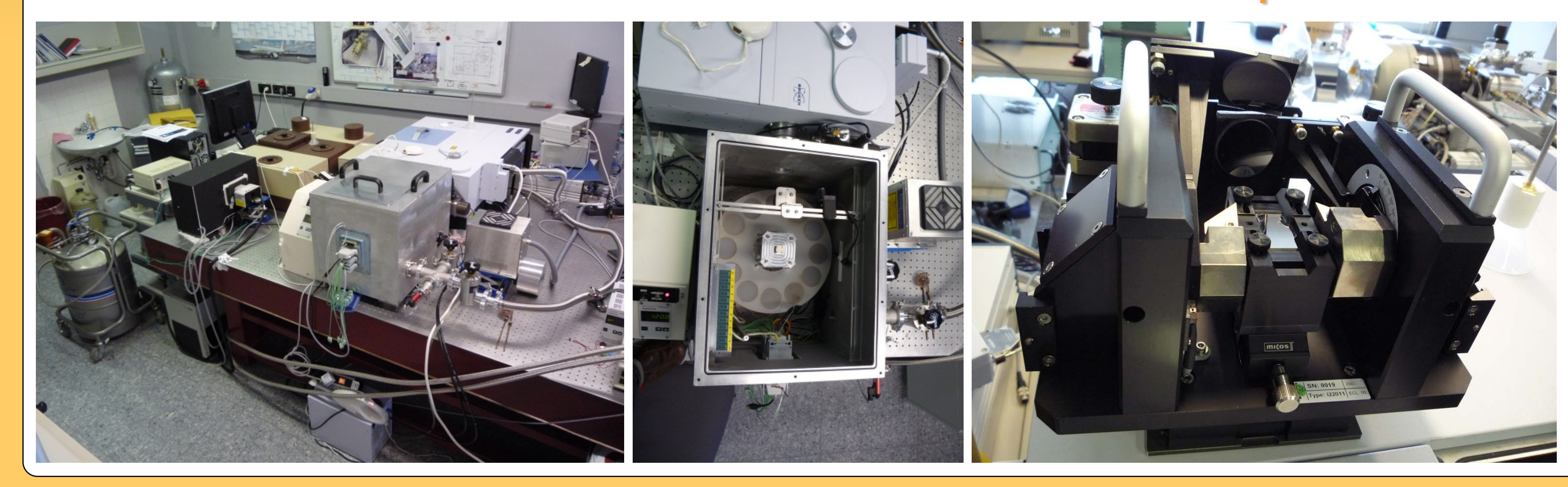
¹Department of Agrobiological and Agrochemistry, University of Viterbo, Italy

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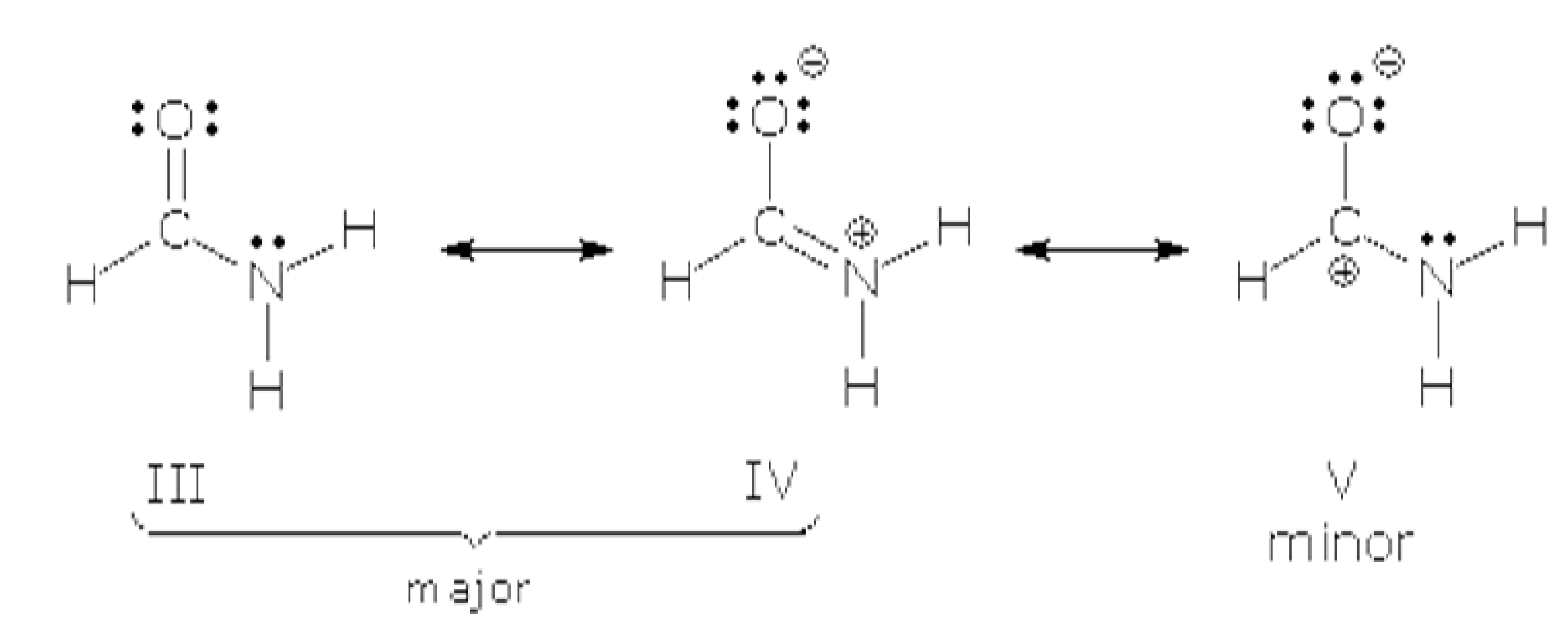
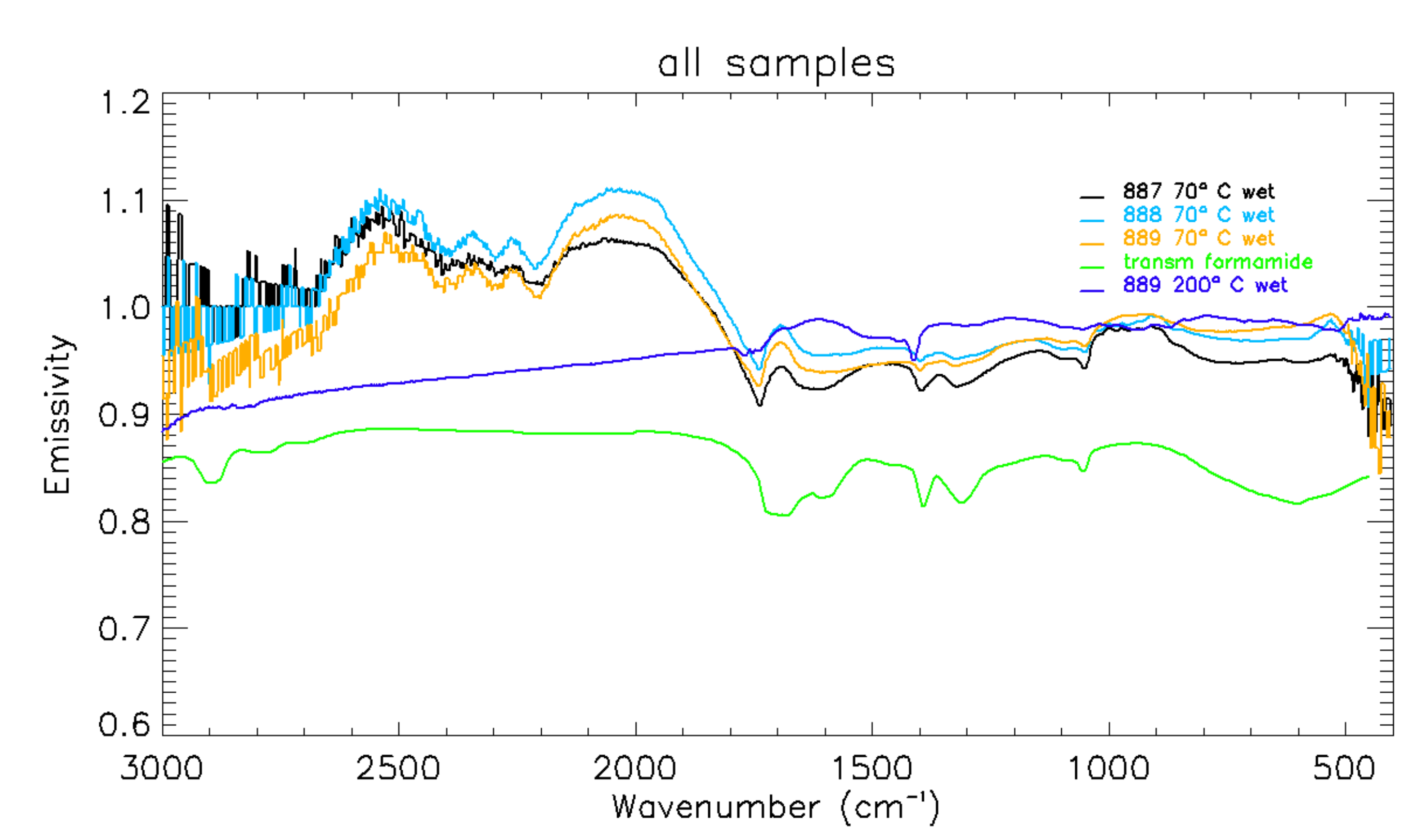
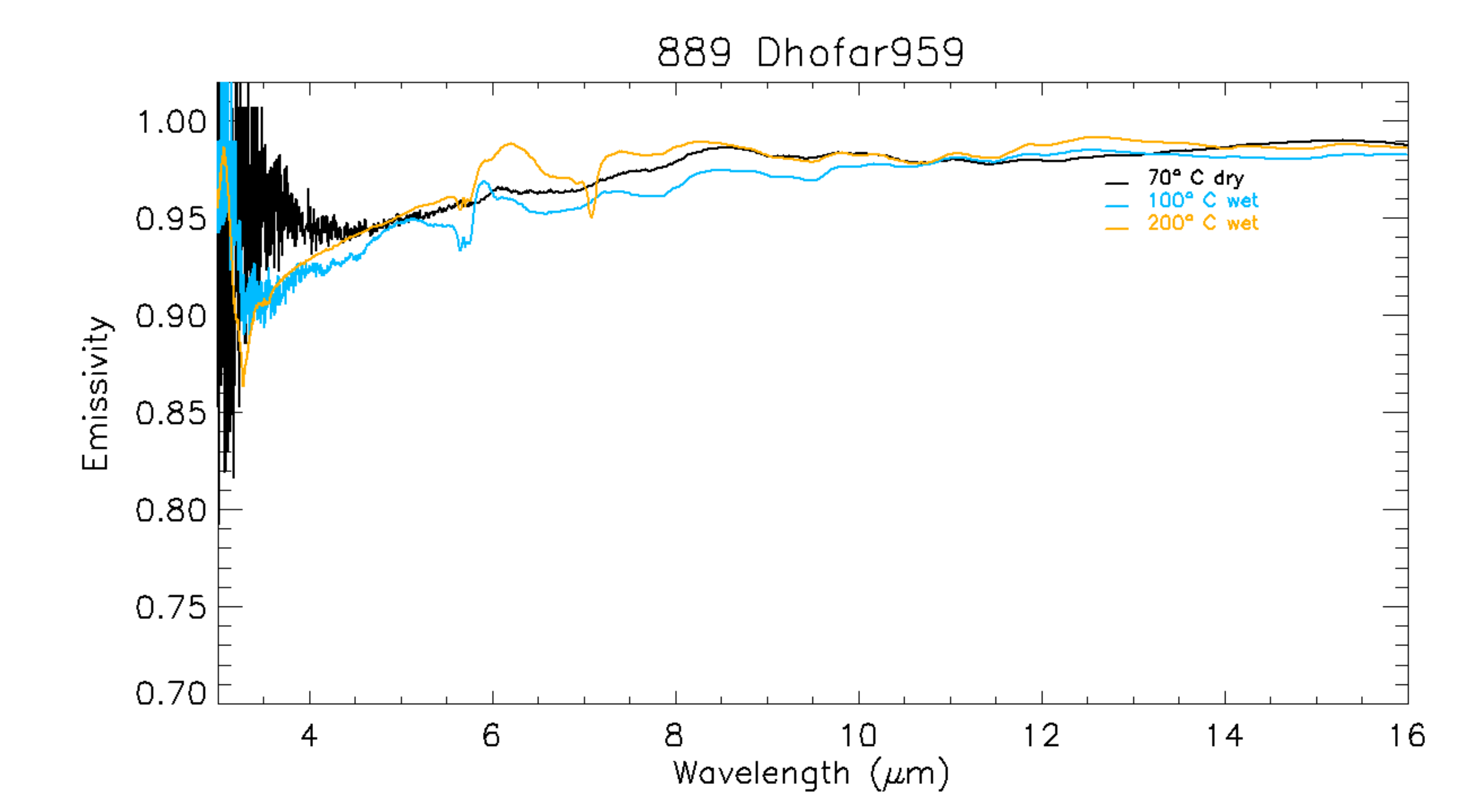
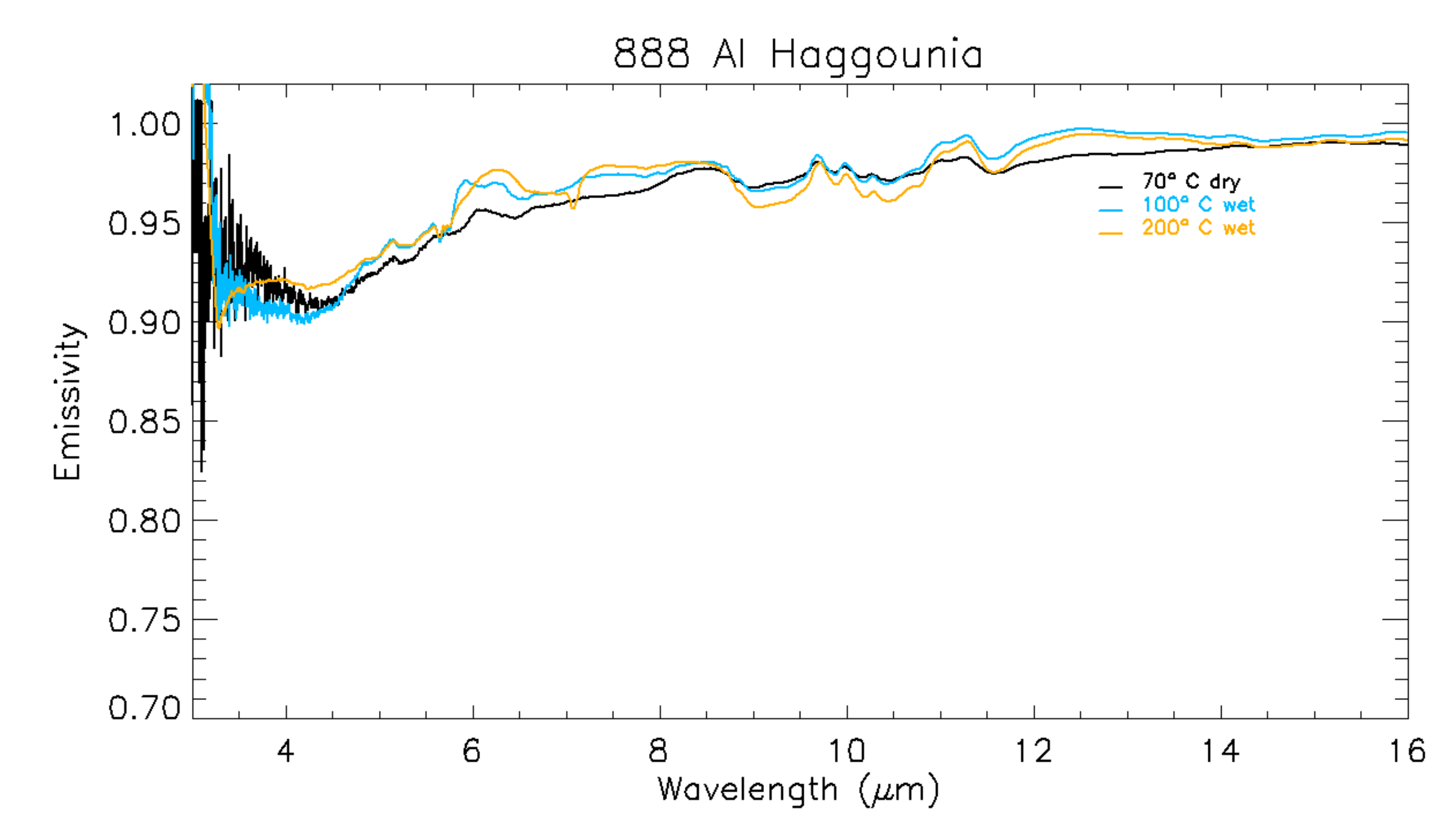
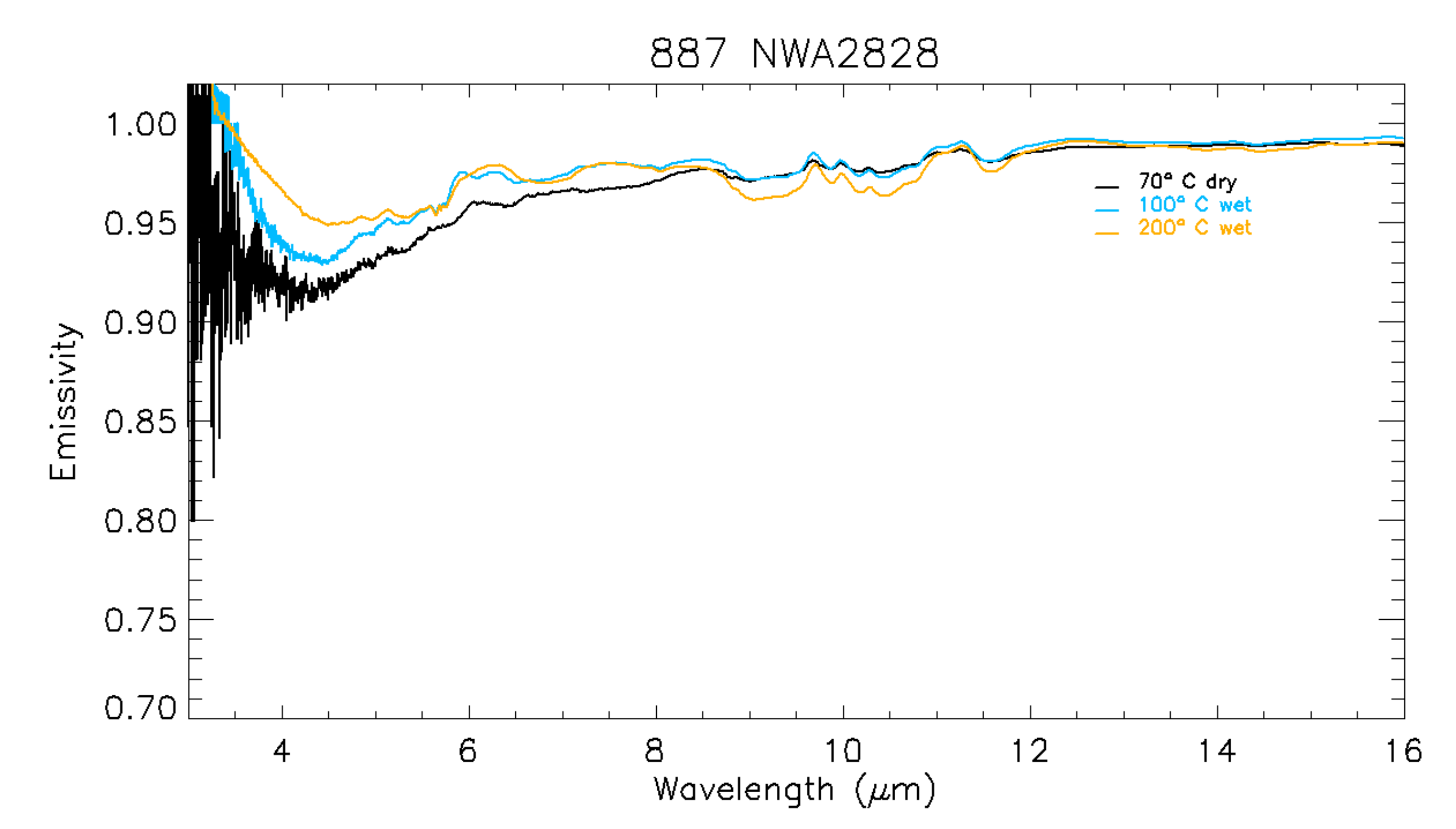
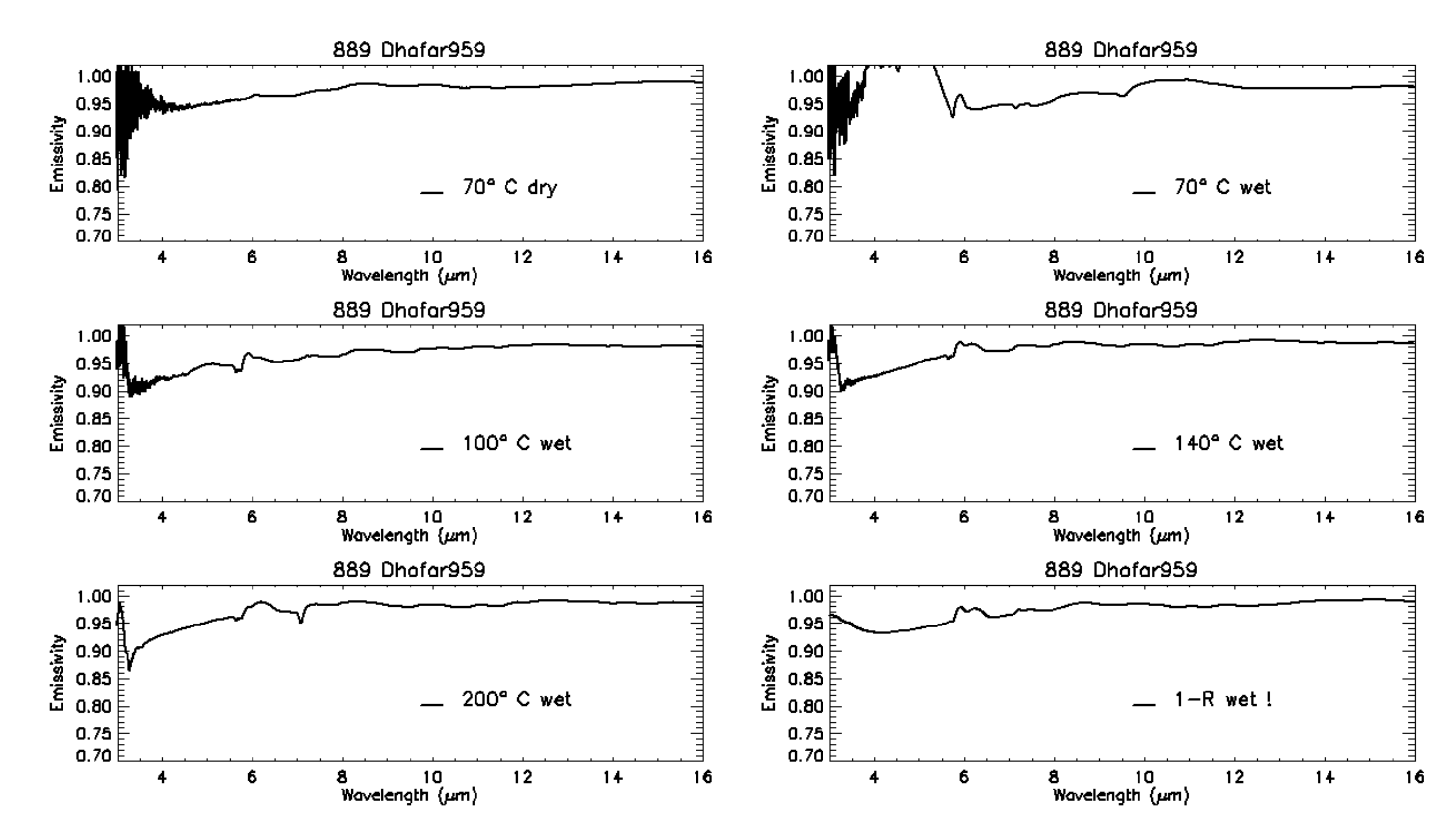
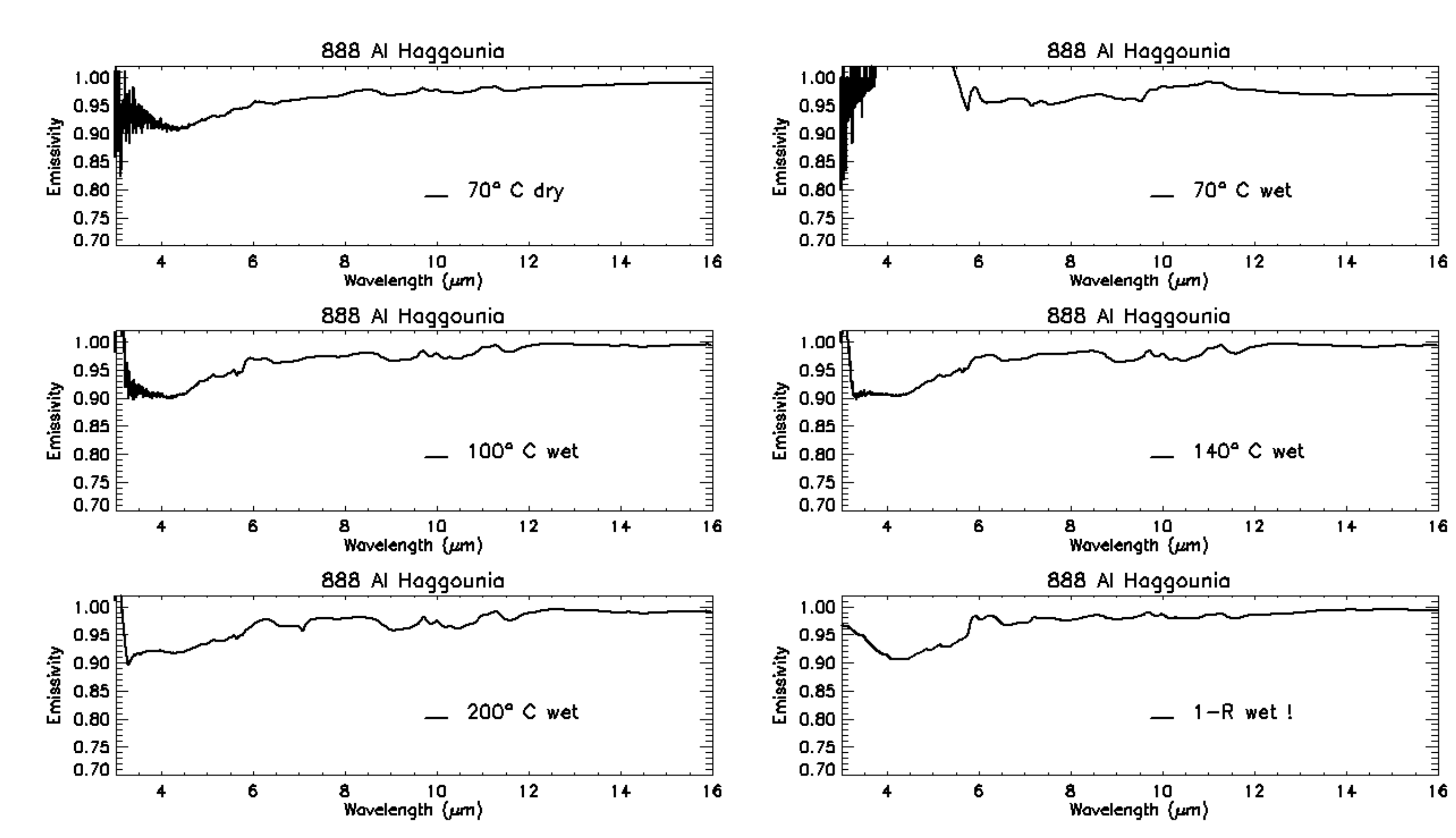
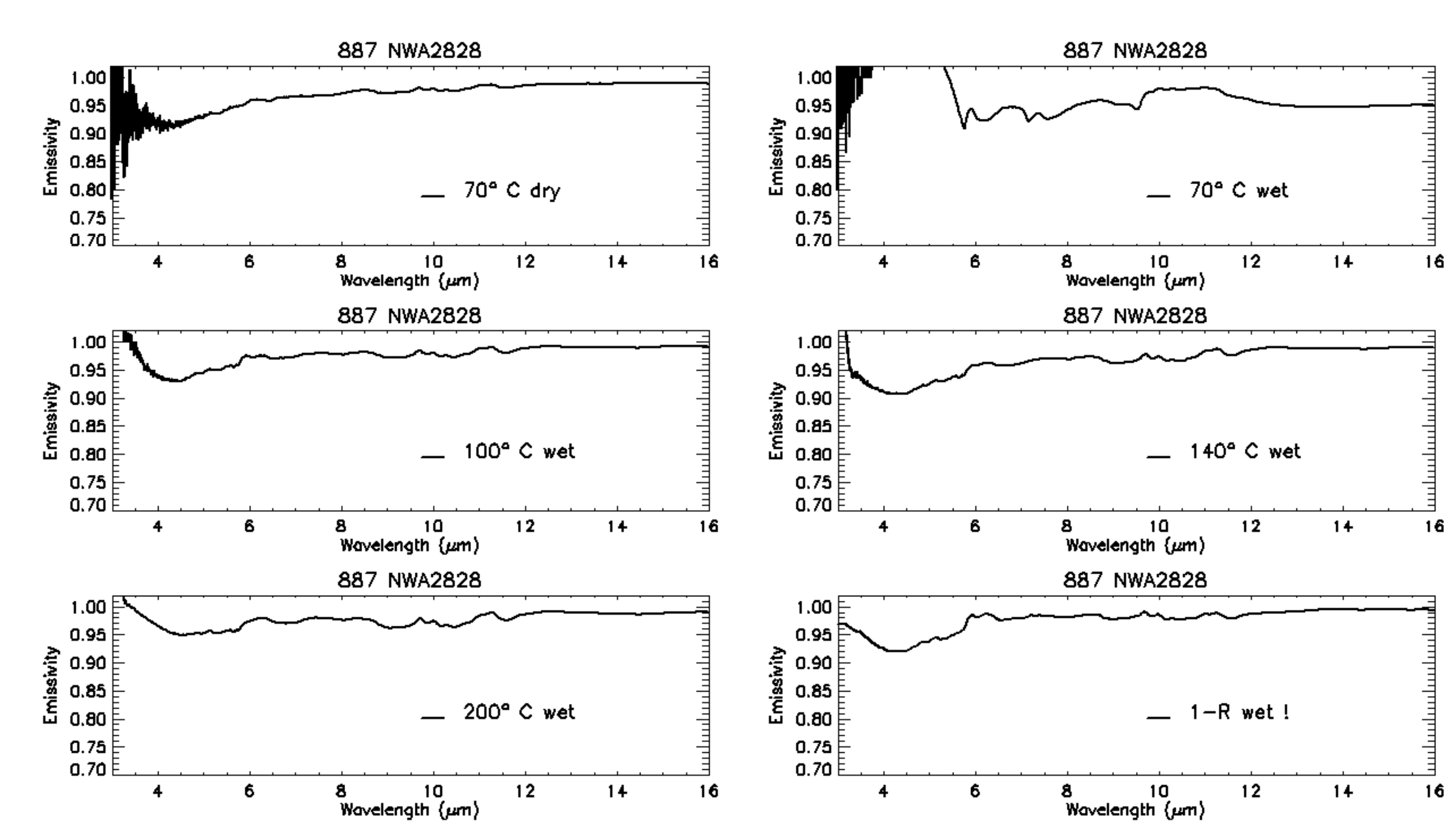


Contact: alessandro.maturilli@dlr.de / joern.helbert@dlr.de

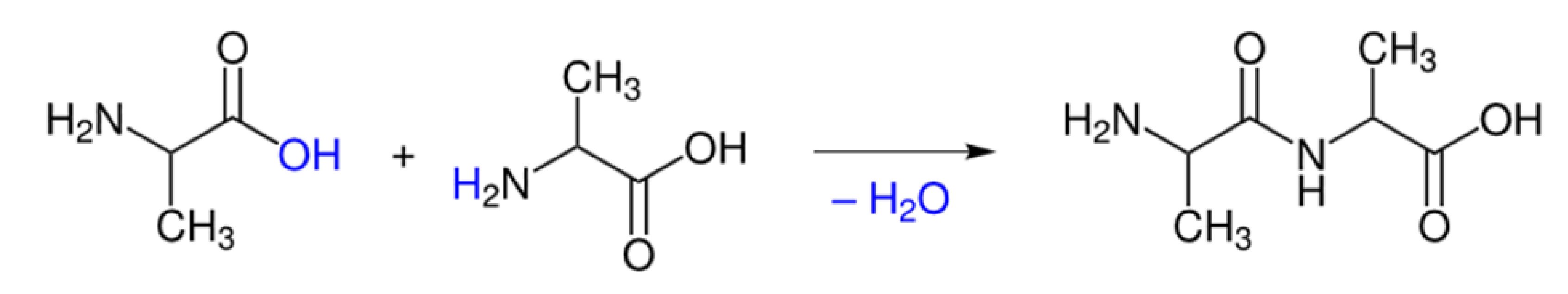
Experimental set-up and samples at the Planetary Emissivity Laboratory (PEL)



We set-up an experiment at the Planetary Emissivity Laboratory (PEL) to investigate a key aspect in the prebiotic chemistry of formamide: the surface reactivity of minerals used as catalysts. The interaction of formamide and the reaction products on mineral surface, as well as, the sequestration processes in the mineral pores, can facilitate the concentration of products allowing for possible polymerization. Three meteorites, NWA2828 (PEL ID 00000887), Al Haggounia (PEL ID 00000888), and Dhofar959 (PEL ID 00000889), reduced in the grain size fraction < 125 μm were used for this experiment. The "dry" meteorites were measured in vacuum (0.8 mbar) at 70° C on the sample surface. Successively liquid formamide was vaporized on the samples surface, the cup was immediately transferred in the emissivity chamber, and evacuated. Each sample was measured at 70°, 100°, 140°, and 200° C.



Reaction with water might form the simple Amino acid Glycine



Example with Alanine by losing water (heating might support this reaction to a certain degree)

For the 889 sample a feature at 7.08 μm appears only at 200° C (but not in reflectance spectra of heated material). The band is shifted with respect to a close feature that we see in formamide transmission, and in warm (70° C) wet samples. The meteorite surface could be acting in the reaction like a catalyst.