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**Routine and Unusual Structures of Copper-Imidazole Complexes with Carboxylate Counter Ions.** Mark Whitener, Mousumi Roy, Sandra Victorin, Jessica Kasner, Montclair State Univ., Dept. of Chemistry and Biochemistry, Montclair, NJ 07043 USA.

To model the hydrogen bonds between a metal bound histidine and carboxylate side chain in proteins, we have prepared transition metal complexes of general formula:  $[M(C_3H_4N_2)_6](RCOO)_2$  (where  $M = Mn^{2+}, Co^{2+}, Ni^{2+}$ ;  $RCOO^-$  = various carboxylate ions). In the case of copper systems, a neutral square planar complex of formula  $[Cu(C_3H_4N_2)_2(RCOO)_2]$  appears to be favored. This geometry occurs when the carboxylate is 2,4-dichlorobenzoate. With 3,5-dinitrobenzoate as the anion, we isolated a crystal of composition:  $[Cu(C_3H_4N_2)_5](RCOO)_2 \cdot H_2O$  that contained a five coordinate copper with geometry intermediate between square pyramidal and trigonal bipyramidal. One Cu-N bond was significantly larger than the other four (2.201 vs. ave. of 2.02 Å). The imidazole with the longer bond does not form a hydrogen bond. The crystal formed with the dianion of phthalic acid contains bis(imidazole) copper units bridged by the dicarboxylates. There are two crystallographically independent five coordinate coppers in the structure. The coordination spheres of the two coppers are different, but both have four shorter bonds of approximately 2.0 Å and a fifth longer bond of 2.310 Å for one copper and 2.497 Å for the other.