

# Synthesis, Crystal Structure, and Spectral Properties of a Novel $\mu$ -1,1-Diazido-Bridged Dinuclear Fe(III) Complex with an N,N,O-Donor Tridentate Schiff Base Ligand

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**Abstract:** A Fe(III) complex,  $[Fe_2L_2(\mu-N_3)_2(N_3)_2]$  (**1**), was synthesized using a tridentate N,N,O-donor Schiff base ligand, HL, formed by the condensation of salicylaldehyde and N,N-dimethyl-1,2-diaminoethane. The complex was characterized through X-ray structural analysis and spectral studies. The crystal structure reveals a centrosymmetric Fe(III) dimer, with two Fe atoms bridged by two  $\mu$ -1,1-azide ligands. Each iron center adopts a distorted octahedral geometry, coordinated by the chelating tridentate Schiff base ligand and a terminal azido group, completing the hexacoordination environment

**Keywords:** Ligand, Crystal structure, Schiff base, Chelating, tridentate