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Ba_2YRuO_6: High-T_c superconductivity without CuO_2 planes. HERMANN AZEMTSA DONFACK, Arizona State University — Doped Ba_2YRuO_6 begins superconducting at 93 K, although it has no cuprate-planes. It does have Cu as a dopant, but superconducts with so little Cu (1%) [S. M. Rao et al., J. Crystal Growth **235,** 271 (2002)] that it is clearly not a cuprate-plane superconductor. This means that CuO_2 planes are not needed for high-T_c superconductivity. It also means that all theories of high-T_c superconductivity based on cuprate-planes superconducting are incorrect, or else that there are at least two theories of high-T_c superconductivity, not just one: one for cuprate-plane materials, and one for ruthenates. (It is our opinion that there is just one theory of high-T_c superconductivity, and that it involves superconductivity in the BaO or similar layers.) In doped Sr_2YRuO_6, a sister compound of Ba_2YRuO_6 that begins superconducting at 49 K, the superconductivity is clearly in the $(SrO)_2$ layers, not in the Cu-doped $YRuO_4$ layers, which contain magnetic fields of order 3 kG in zero applied field, and so are unlikely layers to superconduct [J. D. Dow and D. R. Harshman, J. Low Temp. Phys. **131,** 483 (2003)]. Unlike doped Ba_2YRuO_6, doped Ba_2GdRuO_6 does not superconduct, because Cooper pairs in the BaO layer are disrupted by the magnetic ion Gd.

Hermann Azemtsa Donfack
Arizona State University

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