

Abstract Submitted
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Standard Model for Superconductivity in Graphite Intercalation Compounds: Prediction of Optimum T_c YASUTAMI TAKADA, ISSP, University of Tokyo — Based on the model that was successfully applied to the explanation of superconductivity with the transition temperature T_c of about 0.1K or less in the alkali- intercalated graphite compounds such as KC_8 , RbC_8 , and CsC_8 in 1982 [Y. Takada, *J. Phys. Soc. Jpn.* **51**, 63 (1982)], we have calculated T_c for the alkaline-earth- intercalated graphite compounds including CaC_6 , YbC_6 , and SrC_6 with T_c of about 10K or less to find that the same model reproduces the observed T_c in those compounds as well, indicating that it is a standard model for superconductivity in the graphite intercalation compounds with T_c ranging over three orders of magnitude. The difference in T_c by two orders between KC_8 and CaC_6 can be accounted for by (i) doubling Z the valency of the metal ions, which enhances T_c by one order, and (ii) tripling m^* the effective mass of the superconducting three-dimensional electrons in the interlayer band, which also enhances T_c by one order. Enhancement of T_c well beyond 10 K is also predicted in this model, if intercalant metals are judiciously chosen so that both Z and m^* are increased further.

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