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Superconductivity at T_C=38 K in Pristine and Sulfur Doped Amorphous Carbon ISRAEL FELNER, The Hebrew University, Jerusalem, 91904, Israel, YAKOV KOPELEVICH, R. RICARDO DA SILVA, Instituto de Física "Gleb Wataghin", Universidade Estadual de Campinas, Unicamp 13083-970, Campinas, São Paulo, Brasil — Detailed dc magnetic studies perormed on pristine amorphous carbon and on sulfur doped amorphous carbon, clearly indicate the existence of inhomogeneous superconductivity with $T_C$ranging from 32 to 38 K. The superconducting phase fraction is about 0.5%. Superconductivity is manifested by: (i) the diamagnetic shielding state, (ii) the Meissner effects and (iii) the typical M(H) hysteresis loops. The results indicate that amorphous carbon is a system with non-perculative superconducting phase. Chemical analysis shows that the amorphous carbon contains a small amount of sulfur. It is propossed that superconductivity stems from an unknown C-S phase immersed in amorphous carbon, thus it is concluded that súlfur is a effective dopant to induce superconductivity in carbon (graphite) based materials. The various options for the C-S superconducting phase will be discussed.

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