

Fermi Gas Like Hypothesis for Fleischmann-Pons Experiment

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Pauli repulsion, which is stronger than Coulomb repulsion, is absent in a gas of bosons. Coulomb repulsion is absent in a gas of fermions whose two Fermi seas are at a low relative temperature (like the free electron gas in a cold metal).

To explain Fleischmann-Pons [1] cold fusion, it would suffice to assume that the deuterium nuclei dissolved in the palladium crystal, which are spin-1 bosons, nevertheless show an absence of Coulomb

repulsion the Fermi [1 a] way. This can be achieved by postulating that the bosons are delocalized in the Bloch fashion [2], and that at the same time the properties of a cold Fermi gas apply to the constituent fermions (the protons and neutrons) that make up these composite bosons.

A formal elaboration of this theory is possible. In the meantime we point to a testable implication. By applying a strong magnetic field in conjunction with an RF source (NMR technique), it would be possible to align the spins of the bosons. Hereby these composite bosons will become "doubly polarized" [3] since both subspins are equal. This would suddenly introduce Pauli repulsion amongst all the constituent subparticles, the protons and the neutrons. The cold fusion should therefore come to a virtual stop immediately.

[1] M. Fleischmann and S. Pons, J. Electroanal. Chem **261**, 301–308 (1989).

[1 a] See: L. Landau, Sov. Phys. JETP **3**, 920 (1957).

[2] J. A. Sussmann and Y. Weissman, Phys. Status Solidi **53**, 419 (1972); Y. Fukai and H. Sukimoto, Adv. Phys. **34**, 263 (1985), Sect. 4.32.

[3] F. Laloë and F. H. Freed, Scient. Amer. **258**(4), 70 (1988).

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