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Too big to see: overlooked plasma-destroying reaction with cross section10^{12} times that for fusion necessitates redesign of ITER* BOGDAN MAGLICH, DAN SCOTT, TIM HESTER, California Science & Engineering Coporation (CALSEC), CALSEC COLLABORATION — Existence of *charge transfer* collisions (CT) was overlooked in ITER design[1,2] although CT cross section[3], σ_{CT} $\sim 10^9$ b, is $\sim 10^{12}$ times that for fusion, $\sigma_{DT} \sim$ mb, at T = 10 KeV. CT de-confines plasma by neutralizing ions. Since $\sigma_{CT} = 100\ \sigma_{IO}$, ion $\tau_{CT} \sim \tau_E = 3\text{x}10^{-7}$ s <<thermalization time $\sim$ 0.1 s; plasma cannot form. $\tau_E \sim 1$ s requires operating vacuum p $\sim 10^{-9}$ torr, base 10^{-11} torr. CT oversight brings 4 serious but corrigible errors: –Operating at T = 10-30 KeV below Critical ion energy[4,5] $E_c \sim 200$ KeV, CT prevents plasma formation[6]. Above E_c, ion dominates $\tau_E = 24$ s achieved[-8] with 700 KeV D^+.–No UHV system; base 10^{-7} torr[2]. Based on tenet that $\sigma_{CT}/\sigma_{io} \sim 10^{-2}$, opposite to measured[3] $\sigma_{CT}/\sigma_{io} \sim 10^2$, ionization *by itself*, acts as UHV ion pump; data show it is compressor.–Neutral injection of 10^{22} D/T s^{-1} will result in pressure $\sim$ 1 torr, a "poison."–ITER goal $n\tau \sim 10^{20}$ m^{-3} s^{-1} presented as Lawson[9] is "1% burn-up" criterion; real $n\tau \sim 10^{22}$ $m^{-3}s^{-1}$. *Preprint presented to Fusion Energy Sci. Committee, USDOE 11/11/14. †Deceased (1) Nucl. Fusion 49 065012 (2009). (2)*Pumping Systems for ITER*, 3/01 (2001). (3)Physics Scripta, 23, 143 (81). (4) Evid. Crit. Energy, www.world-scientific-education.net (5) Ibid Am. Phys. Soc. March Meeting 2015, Abstract T34.00004. (6) Exp. Evidence Absence Thermonuc. Fus. Power prod. In TFTR, www.world-scientific-education.net. (7) *Phys. Rev. Lett.* 54, 769 (85). (8) NIM A 271 1-288 (88). (9) Proc. Phys. Soc. B70, 6, (57).

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