

# Nuclear Products of Cold Fusion by TSC Theory

# Akito Takahashi<sup>1,2</sup>

<sup>1</sup> Technova Inc., Japan, akito@sutv.zaq.ne.jp

<sup>2</sup> Osaka University, Japan

Anomalous excess heat without corresponding nuclear radiations have been claimed by cold fusion experiments with metal-deuterium systems (heat/<sup>4</sup>He correlation by Miles, McKubre, et al., very weak alpha-particles by Roussetskii and Lipson, et al, very weak neutron emission by Boss, Takahashi, et al) since 1990s. These claims are challenging to making theoretical models to elucidate underlying physical mechanisms.

The author has elaborated the TSC (tetrahedral symmetric condensate) theory for either the metal-D systems (ACS LENRSB Vol.1 and Vol.2, ICCF17, etc.) or the Ni-H systems (JCMNS Vol.9, JCF12, ICCF17, etc.). The author's past effort has been concentrated on the initial and intermediate states of TSC condensation and strong interaction processes, and the prediction of nuclear products by the final state nuclear interactions have not been deeply studied. In the JCF-13 paper (Nucleon Halo Model of <sup>8</sup>Be\* by Takahashi-Rocha), we have started the study on the final state interaction of 4D/TSC fusion.

This paper reviews and discusses predictable primary and secondary nuclear products as its brief summary is seen in Table-1.

## Why so radiation-less results?

	Claims by Experiments	Predictions by TSC Models
MDE (Metal Deuterium Energy)	Heat: $24 \pm 1 \text{MeV}/^4\text{He}$ (Miles, McKubre, et al)  Weak alpha-peaks (Lipson, Roussetskii, etc)  Weak neutrons (Takahashi, Boss, etc.) <i>X-rays burst</i> (Karabut, et al.)	$23.8 \text{MeV}/^4\text{He}$ by 4D/TSC fusion with low-E alphas (46keV)  Minor alpha-peaks by nucleon-halo BOLEP minor decay channels High-E neutron by minor triton emission <i>BOLEP</i> in ca.1.5keV
MHE (Metal Hydrogen Energy)	Heat w/o n and gamma unknown ash (Piantelli, Takahashi-Kitamura, Celani, etc.)	4H/TSC WS fusion 7-2MeV/ <sup>3</sup> He and d Very weak secondary Gamma and n Ca. $10^{-11}$ of <sup>3</sup> He and d

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Table-1: Claimed anomalous heat phenomena and predictions of TSC theories