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 Catalysts of Nuclear Reaction by
 μ -mesons h. W. Alvarez et al.

10 inch liquid bubble chamber
 15,000 pictures 11,000 gauss
 2,500 μ^- decay cut 75%
 μ^- -meson range 9.17 cm (5.14 MeV)
 π^- - μ^- -decay μ^- a range 1.0 cm (4.1 MeV)

primary
 1mm gap $D/H = 1/5000$
 min H-D in a mean distance
 $1/200$ vibration frequency
 10^{11} per second
 barrier penetration factor 10^{15}

$H + D \rightarrow He^3 + \bar{\nu}$ 5.4 MeV
 $h\nu$ in μ^- ordinary $\mu^- = 1/200$
 (D with Li verify) reduced mass

D-contamination natural
 $\mu^- \rightarrow e^-$ 2500
 $H + D \rightarrow He^3 + \bar{\nu}$ 18
 $He^3 + \bar{\nu} / \mu^-$ ending 1/150
 $He^3 + \bar{\nu}$ per second 35
 D percent 7
 $1/3$ % Estimated 5%
 1600 1000
 38 70
 1/40 1/30

$D + D \rightarrow H^3 + H^3 + \bar{\nu}$ reaction 100%
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μ^-

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