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Title

CHARGE EXCHANGE AND IONIZATION BY HIGHLY STRIPPED Pb^{q+} IONS IN GAS TARGETS

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Charge Exchange and Ionization by Highly Strip-
ped Pb^{q+} Ions In Gas Targets*, J.A. TANIS, K.H. BERKNER,
R.V. PYLE, A.S. SCHLACHTER, P. SCHNEIDER, K. STALDER, and
J.W. STEARNS, Lawrence Berkeley Laboratory, Berkeley, CA.
94720--Electron capture, loss, and ionization cross sec-
tions have been determined for 922 MeV Pb^{q+} (q = 50-59)
ions incident on H₂. In addition, capture and loss cross
sections for Pb⁵⁴⁺ ions in He, N₂, Ne, Ar, and Xe target
gases were determined. The H₂-target results extend ex-
perimental verification of our scaling rule¹ for electron
loss (capture plus ionization) from a hydrogen target to
ions with charge states as high as 59+. The single elec-
tron capture cross section in H₂ increases from 3-4.5 x
10⁻¹⁹ cm² with increasing incident charge state, while the
single electron loss cross section decreases from 3.5-
1.5 x 10⁻¹⁹ cm². The ionization cross sections in H₂
are large with values ~2-2.5 x 10⁻¹⁴ cm². The capture
and loss cross sections for Pb⁵⁴⁺ ions in other gases in-
vestigated show a uniform increase with increasing Z of
the target, reaching values of ~ 8 x 10⁻¹⁷ cm² for cap-
ture and ~ 3.5 x 10⁻¹⁸ cm² for loss.

1. Olson *et al.*, Phys. Rev. Lett. 41, 163 (1978).

* This work was supported by the Fusion Energy Division
of the U. S. Department of Energy under contract No.
W-7405-ENG-48.

- () Prefer Poster Session
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() No Preference
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Submitted by:

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