

S24. Compilation of Bibliography on Low Energy Electron Collision Cross Sections for Atoms and Molecules

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We have compiled the bibliographies on low energy electron collision cross sections for about 60 atoms and small molecules. A bibliography includes only the references for single atom or molecule. These bibliographies contain the references of the original research papers which had reported measurements or theoretical calculations of cross sections for electron collisions with neutral species of ground state and also metastable state. Though those for the electron collisions with positive ions are excluded, the references on electron swarm are included, because some collision cross sections are most accurately determined by these swarm data. The earlier papers surveyed in the present compilation go back to the beginning of atomic and molecular physics in the 1910's of Townsend and Ramsauer days. These bibliographies are essentially completed through calendar year 1996. But some new references published in 1997 are also included.

The present bibliographies include papers reporting electron impact measurements or calculations of the following quantities :

- (1) elastic collision.
- (2) rotational excitation.
- (3) vibrational excitation.
- (4) electronic excitation.
- (5) dissociation.
- (6) ionization.
- (7) attachment.
- (8) electron swarm.
- (9) ionization

coefficient. (10) others.

The last include important photon cross section data, potential energy, lifetime of excited state and so on, and the choice is somewhat arbitrary. The energy range of electron cross section data covered is approximately 0 - 10 keV.

Target atoms and molecules included are as follows :

He, Ne, Ar, Kr, Xe, Li, Na, K, Rb, Cs, O, F, Cl, Br, I, Cu, Cd,

H<sub>2</sub>, D<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, CO, NO, F<sub>2</sub>, Cl<sub>2</sub>, Br<sub>2</sub>, I<sub>2</sub>, HF, HCl, HBr, HI,

H<sub>2</sub>O, CO<sub>2</sub>, N<sub>2</sub>O, NO<sub>2</sub>, SO<sub>2</sub>, OCS, CS<sub>2</sub>, H<sub>2</sub>S, O<sub>3</sub>,

C<sub>2</sub>H<sub>2</sub>, NH<sub>3</sub>, NF<sub>3</sub>, BF<sub>3</sub>, BCl<sub>3</sub>, H<sub>2</sub>CO,

CH<sub>4</sub>, CF<sub>4</sub>, CCl<sub>4</sub>, CH<sub>3</sub>Cl, CCl<sub>2</sub>F<sub>2</sub>, SiH<sub>4</sub>, GeH<sub>4</sub>,

C<sub>2</sub>H<sub>4</sub>, CH<sub>3</sub>OH, SF<sub>6</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>2</sub>F<sub>6</sub>, Si<sub>2</sub>H<sub>6</sub>, C<sub>2</sub>H<sub>5</sub>OH,

C<sub>3</sub>H<sub>8</sub>, C<sub>4</sub>F<sub>8</sub>, C<sub>6</sub>H<sub>6</sub>.

A series of these compilations for the specific species will be published soon in NIFS-Data Report.