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Collisions between Electrons and the  $Cl_2^-$  Ion D. PEGG, Dept. of Physics, University of Tennessee, G. COLLINS, K. FRITIOFF, J. SANDSTROM, D. HANSTORP, Dept. of Physics, Gothenburg University, Gothenburg, Sweden, R. THOMAS, F. HELLBERG, A. EHLERDING, M. LARSSON, Dept. of Physics, Alba Nova, Stockholm University, Stockholm, Sweden, F. OSTERDAHL, Dept. of Physics, Royal Institute of Technology, Stockholm, Sweden, A. KALLBERG, H. DANARED, Manne Siegbahn Lab., Stockholm, Sweden — Collisions between electrons and molecular negative ions result in the following fragmentation processes: detachment, dissociation and detachment plus dissociation. In some cases attachment also occurs, resulting in resonance structure associated with the transient formation of a doubly charged negative ion. We report on a measurement of the cross sections for detachment, dissociation and detachment plus dissociation for the  $e^-$  - $Cl_{2}^{-}$  collision system over a collision energy range 0-200 eV. The merged electron-ion beam experiment was performed at the heavy ion magnetic storage ring, CRYRING, situated at the MSL in Stockholm [1]. Over the energy range studied, the dominant breakup mechanism is dissociation. A prominent structure was observed just above threshold in the  $Cl^- + Cl + e^-$  dissociation channel. It is proposed that the structure is a resonance associated with the production and rapid decay of an excited state of the doubly charged  $Cl_2^{2-}$  ion.

[1] G.F.Collins et al, Phys. Rev. A 72, 042708 (2005).

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