$CL_3{}^-$ ELECTRON PHOTODETACHMENT SPECTRUM: MEASUREMENT AND ASSIGNMENT

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An electron photodetachment spectrum of $Cl_3{}^-$ is reported for 193 nm (6.42 eV) excitation. The spectrum was assigned using high-level *abinitio* calculations for the Cl_3 radical and the $Cl_3{}^-$ anion. A broad band centered around 1.25 eV (electron kinetic energy) has been assigned to the $Cl_3{}^-(X^1\Sigma^+{}_g) \rightarrow Cl_3(X^2\ \Pi_u)$ and $Cl_3(1^2\Sigma^+{}_g)$ transitions. Vertical photodetachment accesses the transition state region for the Cl exchange reaction: Cl + Cl_2 $\longrightarrow$ Cl_2 + Cl. A narrow doublet band at 0.55 eV is assigned to the $Cl_3{}^-(X^1\Sigma^+{}_g) \rightarrow Cl_3(1^2\Pi_g)$ transition, split by spin-orbit interaction.