In this work, we study low-energy electron-molecule collisions. To understand these processes, it is necessary to explain the phenomena appearing in so called 2D electron energy-loss spectra. These spectra are very different for different molecules, which we still cannot explain satisfactorily. Therefore we would like to gain deeper understanding through mathematical modeling of the problem. The collision of an electron with a molecule can be mathematically formulated in the language of partial integro-differential equations. The discretization converts the problem to a system of linear algebraic equations with a complex symmetric matrix. The matrix of this system is also sparse and for this reason we believe that the use of iterative methods to solve the resulting system is a suitable choice. However, as we were convinced when testing the convergence rate of the Krylov subspace methods for the model with two degrees of freedom (which we dealt with in the bachelor thesis), iterative methods suffer from slow convergence. This motivated us to try using preconditioning which is considered to be crucial for the reliability of iterative techniques across the literature. Our main goal in this work was to find a suitable preconditioning technique for Krylov subspace methods, which would ensure their faster convergence.