HELIUM PRESSURE BROADENING OF OCS FROM 4-23 K

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We report experimentally measured cross sections for pressure broadening of OCS by He from 4.2 to 23 K using the collisional cooling technique. Cross sections were obtained for the broadening of the $J = 2 \leftarrow 1$, $J = 3 \leftarrow 2$ and $J = 4 \leftarrow 3$ rotational transitions of OCS. Theoretical cross sections were also calculated using a recent He-OCS potential surface. At temperatures near 20 K, we observe a modest disagreement between experiment and theory. However, with decreasing temperature experiment and theory display a widening divergence, with calculated cross sections rising steeply while experimental values remain constant or fall slightly. Insight into this disagreement will be presented through comparison with other recent low temperature pressure broadening studies in which a similar discrepancy has been observed.