



Constraining the ClO / ClOOCl Equilibrium Constant from Aura MLS Measurements of Nighttime ClO

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The Aura Microwave Limb Sounder (MLS) has observed significant nighttime enhancements in lower stratospheric ClO poleward of about 60 degrees in both Arctic and Antarctic winters. Measured abundances of ClO in darkness can be used to constrain the value of the equilibrium constant, K_{eq} , which governs the partitioning between ClO and its dimer, ClOOCl. Several recent studies have suggested lower values of K_{eq} than are currently recommended in JPL [2006]. We investigate the temperature dependence of the polar nighttime ClO enhancements observed by MLS. Assuming that the nighttime chlorine reservoir is ClOOCl, the atmospheric measurements provide a constraint on K_{eq} that is different from the extrapolation of laboratory data (obtained at temperatures above about 240 K) to the relevant stratospheric temperature regime. Preliminary results suggest that, consistent with previous studies, using a lower K_{eq} than currently recommended improves agreement with MLS measurements of nighttime ClO.