The CN-radical and OH-parent production rates in comet C/1977 R1 (Kohler)

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The present work aims at obtaining information on the overall activity of the bright and extremely long-period (over 100,000 years with a nearly parabolic orbit) comet 1977m = 1977 XIV = C/1977 R1 (Kohler). The comet was observed with an Optical Multichannel Analyzer (OMA) of 500 channels, attached to the 0.61-m Boller & Chivens telescope at the Abrahão de Moraes Observatory of the University of São Paulo in Valinhos (SP, Brazil).The spectral region scanned was in the interval 3555 Åto 4140 Å, where the intense CN (0,0) band was detected. The continuum was very weak suggesting a low dust-to-gas ratio. From the 8.56×10^{-11} erg cm^{-2} s^{-1} total observed flux corrected for atmospheric extinction of the CN (0,0) spectrum, a total number and a production rate of CN molecules in the coma was computed as 1.8×10^{31} and 7.8×10^{25} molecules s^{-1}, respectively. We also have deduced, semi-empirically (de Almeida, Singh & Huebner 1997), the OH-parent (presumably H_2O) production rates from the photometric observations (total visual brightness) taken from the ICQ Archive of Photometric Data on Comets. Our present result (3.01×10^{28} molecules s^{-1} at 0.991 au) is in excellent agreement with that obtained by Despois et al. (1979). Assuming a fractional active surface area of 10% on the sunlit hemisphere, we estimate a minimum effective nuclear radius of 4.2 km for comet Kohler.

Acknowledgements: In memoriam: S. Codina Landaberry. Figure by courtesy of Michael Kohler.