CO^+ AND CN GAS RELATIONS IN COMET 1P/HALLEY. M. R. Voelzke[1], [1]Cruzeiro do Sul University (Regente Feijó Avenue 1295, 03342-000, São Paulo, SP, Brazil. E-mail: mrvoelzke@hotmail.com)

Introduction: Photographic and photoelectric observations of comet 1P/Halley´s ionized gas coma from CO^+ at 4,250 Å and neutral gas coma from CN at 3,880 Å were part of the Bochum Halley Monitoring Program, conducted from 1986 February 17 to April 17 at the European Southern Observatory on La Silla (Chile).

In this spectral range it is possible to see the continuous formation, motion and expansion of plasma and neutral gas structures. To observe the morphology of these structures, 32 CO^+ photos (glass plates) from comet 1P/Halley obtained by means of an interference filter have been analysed. They have a field of view of 28.6° × 28.6° and were obtained from 1986 March 29 to April 17 with exposure times between 20 and 120 minutes.

All photos were digitized with a PDS 2020 GM microdensitometer. After digitization, the data were reduced to relative intensities, and those with proper calibrations were also converted to absolute intensities, expressed in terms of column densities. The CO^+ absolute intensity values still contain the continuous intensity. To calculate the CO^+ column density it is necessary to subtract this continuous intensity.

The relations between CO^+ and CN in average column density values (N_{CO^+}/N_{CN}) are 11.6 for a circular diaphragm with average diameter (Φ) of 6.1' with corresponds to a distance from the nucleus (ρ) equal to 6.3×10^4 km; 20.0 for Φ = 7.1' and $\rho = 7.3 \times 10^4$ km; 8.1 for Φ = 8.5' and $\rho = 8.7 \times 10^4$ km; 35.6 for Φ = 11.9' and $\rho = 1.2 \times 10^5$ km; and 31.3 for Φ = 16.7' and $\rho = 1.7 \times 10^5$ km. These values are in perfect agreement with the data for short distances (ρ from 3.9×10^3 to 1.2×10^4 km) and small slit diameters (Φ from 0.4 to 1.2 arcminutes).

With the use of diaphragms with large diameters it is possible to get some information about the outer coma of the comet (in this paper, from 60,000 until 170,000 km away from the nucleus). At these distances, the CO^+ column density changes only due to the geometrical dilution, because the CO^+ parent molecules are already photoionised or photodissociated.