

THE COMA: PANEL DISCUSSION

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I would just like to make a brief summary of some of the major points in my review two days ago. The most important results from the cometary UV observations are: (1) We know now that the gas production rates of a medium bright comet is on the order of 10^{30} molecules s^{-1} based on hydrogen Ly α observations and interpretations. (2) The large amounts of OH indicate that water is an abundant molecule. I do not know of any other probable parent molecule of OH. The case for water as a parent molecule is strengthened by the parallel decrease of OH and H in comet Bennett and by arguments given by Delsemme. (3) Disregarding the observed amounts of OH and O, one would not necessarily conclude that the hydrogen is a dissociation product of water. The uncertainty is due to the deduced outflow velocities of about 8 km s^{-1} . I feel this value for the velocity is pretty mysterious and not yet explained. We have yet to connect this velocity with the dissociation -- or formation -- producing the hydrogen atoms. The possibility that an appreciable amount of hydrogen does not stem from water cannot be excluded. (4) The UV observations of comet Kohoutek seem to indicate that water is not predominate over other molecules by two orders of magnitudes. The production of carbon atoms (and, therefore, of parent molecules containing carbon) seems to be nearly as great as that of water. The uncertainties of the numbers for the production rates are at least factors of two. I, personally, think it is too early to draw definite conclusions on the various abundance ratios. H, O, OH, and C may well be produced in the same

order of magnitude. But a C deficiency by an order of magnitude (or even more) is not rules out either.

We need observations of other bright comets to improve and confirm the results. I am sure we can then settle these questions and come up with firm conclusions. I do not have to stress the importance and implications of the abundance ratios for the nature of the cometary origin and development. (5) We also need improved models of the coma taking into account at least some of the complex formation processes in the inner coma, the excess dissociation energies, and the resulting velocity distributions.