metastable (and excited) atoms and molecules, produced under irradiation. An important general result established by Prof. Joshi over a wide range of conditions, is that this phenomenon does not occur at potentials less than V_m,[1,5] 'the minimum threshold potential' when the gas breaks down as a dielectric.[5] In fact, it was from the observation by Prof. Joshi of a photo-increase of V_m[1] that (arguing from the finding that the current depends upon $V - V_m$[6]), he predicted that the corresponding current should decrease under light. Whatever be the actual mechanism of this phenomenon, it has significance for the current theories of photo-electric action and represents a hitherto unrecognised factor in conduction under electrical discharge.

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June 20, 1945. B. N. PRASAD.

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THE BANDS OF PO MOLECULE

A VIBRATIONAL quantum analysis of the bands of phosphorous monoxide in the region λ 2600 has been published by Ghosh and Ball[1] and a rotational analysis of some bands of this system has been given by Sen Gupta.[2] The bands are shown to be due to $^2\Sigma \rightarrow {}^2\pi$ transition. Besides this system, the PO molecule is well known to give rise to other characteristic groups of bands in the region λ 3300. The vibrational analysis of these bands does not appear to have been published so far. In the course of investigations, in this Laboratory, on the P_2 bands[3] excited under different conditions, the above-mentioned bands of the PO molecule have been obtained. These bands are found to be strongly emitted in a wide open heavy current arc between carbon poles containing phosphorous pentoxide. Some of the bands are degraded to the red and some to the violet. Several attempts to include all the bands into one system having failed, the red degraded bands are analysed into one vibrational system and the violet degraded bands into another system. The two systems have presumably a common final level 2π identical with the ground state of the ultraviolet system.

The following vibrational constants for the two systems are obtained.

Violet degraded system	Red degraded system
$\nu_e = 30606{\cdot}5$	$\nu_e = 30260{\cdot}8$
$\omega'_e = 1151{\cdot}9$	$\omega'_e = 1094$
$x'_e\omega'_e = 14{\cdot}19$	$x'_e\omega'_e = 14{\cdot}5$
$\omega''_e = 1223{\cdot}9$	$\omega''_e = 1234$
$x''_e\omega''_e = 6{\cdot}46$	$x''_e\omega''_e = 9{\cdot}5$

A detailed account of the work will be published elsewhere.

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June 20, 1945.

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ON THE ULTRA-VIOLET BANDS OF K

BESIDES the three systems of K, in the infra-red and visible regions studied by a number of workers, Yoshinaga[1] measured about 110 band heads in absorption between λ 4160 and λ 3480 A. and arranged them into five different systems, all arising on account of transitions from the $^1\Sigma_g$ ground state to different upper states. The only data at wave-lengths below λ 3480 A. are due to Chakraborty,[2] who noted some bands of K_2 accompanying each member of the principal series line of potassium. Since he worked with an instrument of high dispersion, only few bands could be recorded in his spectrogram.

While working with an Intermediate quartz spectrograph, a large number of bands, not reported earlier between wave-lengths 3690 and 2920 A., has been noted in the present case. Of these, the bands between λ 3200 and λ 3100 A. are much better developed than those lying in the rest of the region. The experimental arrangement consists of an iron tube heated by an electric current flowing through a nichrome wire wound round an asbestos covering over the tube. The ends were closed by quartz windows and were water-cooled. Light from a hydrogen continuum was passed through potassium vapour obtained by heating a purified sample of the metal kept in an auxiliary iron cell inside the furnace tube and analysed by an Intermediate quartz spectrograph. Spectrograms were taken at several temperatures and pressures, the value of the latter being regulated by introducing dry nitrogn gas from a cylinder. The bands given in the table below (being more intense than those appearing in the rest of the region) were obtained at 700° C. when the pressure inside the furnace as read by a mercury manometer was 30 cm. The intensities were estimated from a micro-photogram of the spectrum.

ν cm.$^{-1}$ vac.	v″–v′	Int.	ν cm.$^{-1}$ vac.	v″–v′	Int.
31115	10–4	2	31467	5–2	1
31163	10–5	4	31517	5–3	2
31212	9–4	4	31557	4–2	2
31251	8–3	4	31606	4–3	2
31290	7–2	2	31679	2–1	1
31339	7–3	2	31726	1–0	1
31388	7–4	4	31818	0–0	1
31428	6–3	1	31868	0–1	1