

## Letters to the Editor

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### Comments on "Possible emission from an upper triplet state of an anthraquinone dye"

Allen, Harwood and McKellar [1] reported the observation of an anomalous phosphorescence emission from a specimen of 2-amino-3-carboxy-anthraquinone in ether-isopentane-ethanol glass at 77 K and interpreted this as an emission from an upper  $n\pi^*$  triplet state of the dyestuff. The object of this letter is to point out that the spectrum they observed matches almost exactly that of anthraquinone which has been reported in ref. 2 (455, 490, 536 and 583 nm compared with 455, 492, 534.5 and 585 nm reported in ref. 1 — the spectrum of the latter even shows the same subsidiary peak on the side of the 455 nm peak). May I respectfully suggest therefore that all possibility of the anomalous emission being due to anthraquinone impurity should be rigorously excluded before any other interpretation is considered, because the presence of such anomalous phosphorescence is normally regarded as an indication of impurity. Measurement of the corresponding excitation spectrum (of a sufficiently dilute solution to avoid inner filter effects) would be a first step. This spectrum for anthraquinone is also available [2] for comparison. If traces of anthraquinone are present they could probably be separated and identified by thin layer chromatography or by high pressure liquid chromatography. For trace amounts I believe that this is usually more reliable than mass spectrometry.

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1 N. S. Allen, B. Harwood and J. F. McKellar, *J. Photochem.*, 9 (1978) 565.

2 C. A. Parker, *Photoluminescence of Solutions*, Elsevier, Amsterdam, 1968, pp. 462 - 463.

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### Reply to comments on "Possible emission from an upper triplet state of an anthraquinone dye"

We agree with the comments of Professor Parker and share to a certain extent his scepticism of the assignment. This is why we entitled our paper "Possible emission from an upper triplet state of an anthraquinone dye". We carried out a variety of purification methods, as described in the paper,

including thin layer and column chromatography but could not remove this anomalous emission from the compound.

Finally, we are well aware of the strong resemblance between the emission observed and that of anthraquinone and this is why we followed strict purification procedures.

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