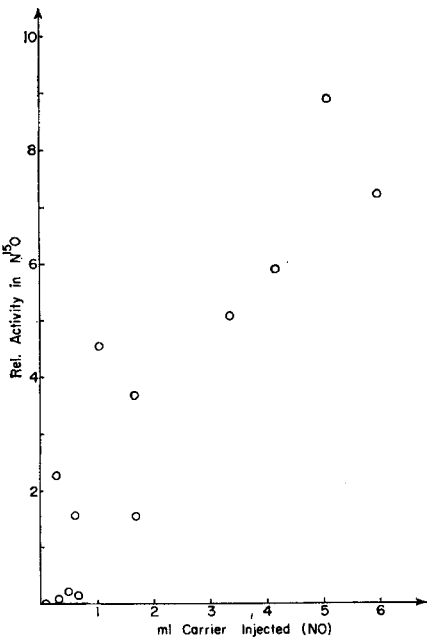
LETTER TO THE EDITOR

^{15}O Labelling of NO via Exchange on a Gaschromatographic Column

Sir :

In our work, dealing with hot atom reactions of oxygen we recently observed that ^{15}O in the form of molecular oxygen exchanges readily with NO at room temperature on the surface of a gas chromatographic column. ^{15}O is produced via the nuclear reaction ^{14}N (*d*, *n*) ^{15}O by passing nitrogen gas through a deuteron beam. When the nitrogen contains oxygen as impurity (ca. 5 ppm) the major ^{15}O containing reaction product is $O^{15}O$. Upon injecting 6 ml portions of the irradiated N_2-O_2 mixture into a 6 foot, 13 X molecular



Increase of ^{15}O activity in NO with increasing amounts of injected NO. For 5 ml injected NO, the specific activity after separation corresponds to approximately 1.5 μc/m mole and the product contains about 30 % of the activity originally present in $O^{15}O$.

sieve column (He as carrier gas) together with increasing amounts of NO as a « carrier » it is observed that the activity originally contained in $O^{15}O$ appears increasingly in $N^{15}O$ (Fig. 1). By replacing the molecular sieve column with a PORAPAK Q column [1], the exchange can quantitatively be eliminated.

With the molecular sieve column, the entire procedure of irradiation, transportation of the irradiated gas, injection onto the column, exchange and separation of NO from other compounds takes but 7 minutes under our conditions [2]. It seems likely that this exchange proceeds rapidly because both, O_2 and NO contain unpaired electrons. N_2O does not undergo a similar exchange.

We have not made any attempts to optimize this exchange procedure with respect to obtaining the labelled product. From previous experiences with exchange labelling on gas chromatographic columns, however, it seems entirely feasible that this method can be improved and applied to a variety of compounds [3-4].

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