

observations also indirectly confirm the conclusions drawn through the simple autoradiography records.

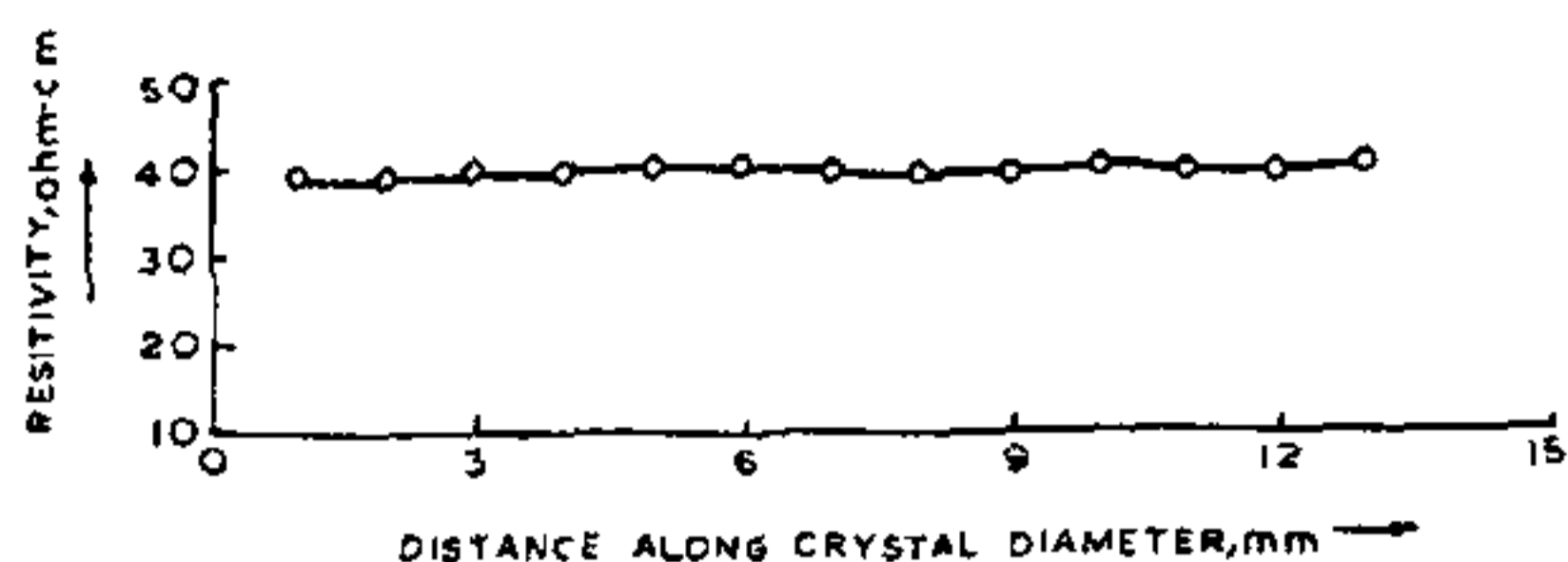


FIG 2. Cross-sectional resistivity distribution in a typical silicon crystal doped with phosphorus by neutron irradiation.

Sincere thanks of the author are due to the Director, Dr. S. C. Jain and other colleagues for encouragement and cooperation.

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 October 18, 1978.

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FISSION TRACK AGE OF TEKTITES FOUND IN RECENT SEDIMENTS

THE most controversial aspect of tektites is the theory of their origin. The geochronological investigations¹⁻⁷ to-date clearly identify four chronological groups of tektites which are associated with four geographical regions of Earth. These groups are: Australites (0.7 my.), Moldavites (15 m.y.), Bediasites (34 m.y.) and Ivory coast tektites (1.2 m.y.). A new strewn field was discovered near Irgiz in Kazakhastan (USSR) by P. V. Florensky in 1975, and keeping in view the tradition of naming them, these tektites are known as Irghizites⁸.

This note is based on fission track investigations of some Australites found in recent sediments of Australia. The samples obtained from Dr. Edmund Gill are classified as R-G and those obtained from Professor R. M. Walker as R-W. There is no recorded evidence of their recent fall except that they have been found to occur in recent sediments or soil layers. The geological ages based on stratigraphy suggest that these tektites belong to a horizon with an age of a few thousand years⁹.

Tektite samples were studied independently at Ottawa (Canada) and at Geochronology Laboratory, Punjabi University, Patiala (Virk⁷).

The fossil track densities observed in the case of R-W and R-G, in both the analyses agree within

5% but induced track densities are found to be different due to different thermal neutron irradiations. The glass dosimeters used were calibrated with a standard glass dosimeter for comparison and cross-checking of results.

The fission track (f:t) age of tektite sample is given by the simplified formula⁷

$$T = 6.01 \times 10^{-3} \frac{\rho_f}{\rho_i} \phi$$

where ρ_f denotes fossil track density, ρ_i the induced track density, and ϕ , the integrated thermal neutron dose specified for irradiation.

The f.t. ages for R-G and R-W are given in Table I. These ages corroborate the K-Ar and f.t. ages determined for Australites^{6,7}. The statistical errors (10-25%) based on counting of fossil tracks are different in the two analyses and are not reported.

TABLE I

Fission track ages of tektites found in recent sediments
 Total thermal neutron dose $\phi = 1.03 \times 10^{15}$ n/cm²

Tektite sample	$\rho_f/\rho_i \times 10^{-2}$	F.T. age m.y.	Age of Australites F.T. age ⁷	K-Ar age
R-G	1.008	0.62
R-W (Core)	1.311	0.81	0.65	0.72
R-W (Flange)	1.212	0.75

The following facts emerge from f.t. analyses of tektites found in recent sediments:

1. The density of fossil tracks recorded in tektites discovered in recent sediments is the same as that observed in other Australites.
2. The f.t. ages determined from flange and core material of R-W sample are not much different. Therefore the solidification age of tektites is the same as the epoch of their fall.

The discordance between tektite ages based on stratigraphic evidence and nuclear methods can be explained on basis of environmental factors and other metamorphic changes occurring at the time or after the arrival of tektites. Hence many attempts to date dry-land specimens by stratigraphy have yielded inconsistent results^{4,5}. Tektites have also been carried about by man since very early times giving rise to fake 'finds'. All such tektites are called 'Vagabonds' by Faul and Wagner¹⁰. We therefore conclude that these so-called recently fallen tektites belong to the same well established chronological group known as Australites.

Authors are grateful to Dr. Edmund Gill, Deputy Director, National Museum of Victoria, Melbourne

Australia, and Prof. R. M. Walker, Director, McDonnell Space Centre, Washington University, St. Luis, Missouri, USA, for the supply of tektite samples. Technical assistance of Sh. Tejinder Mohan Singh in polishing of samples is acknowledged.

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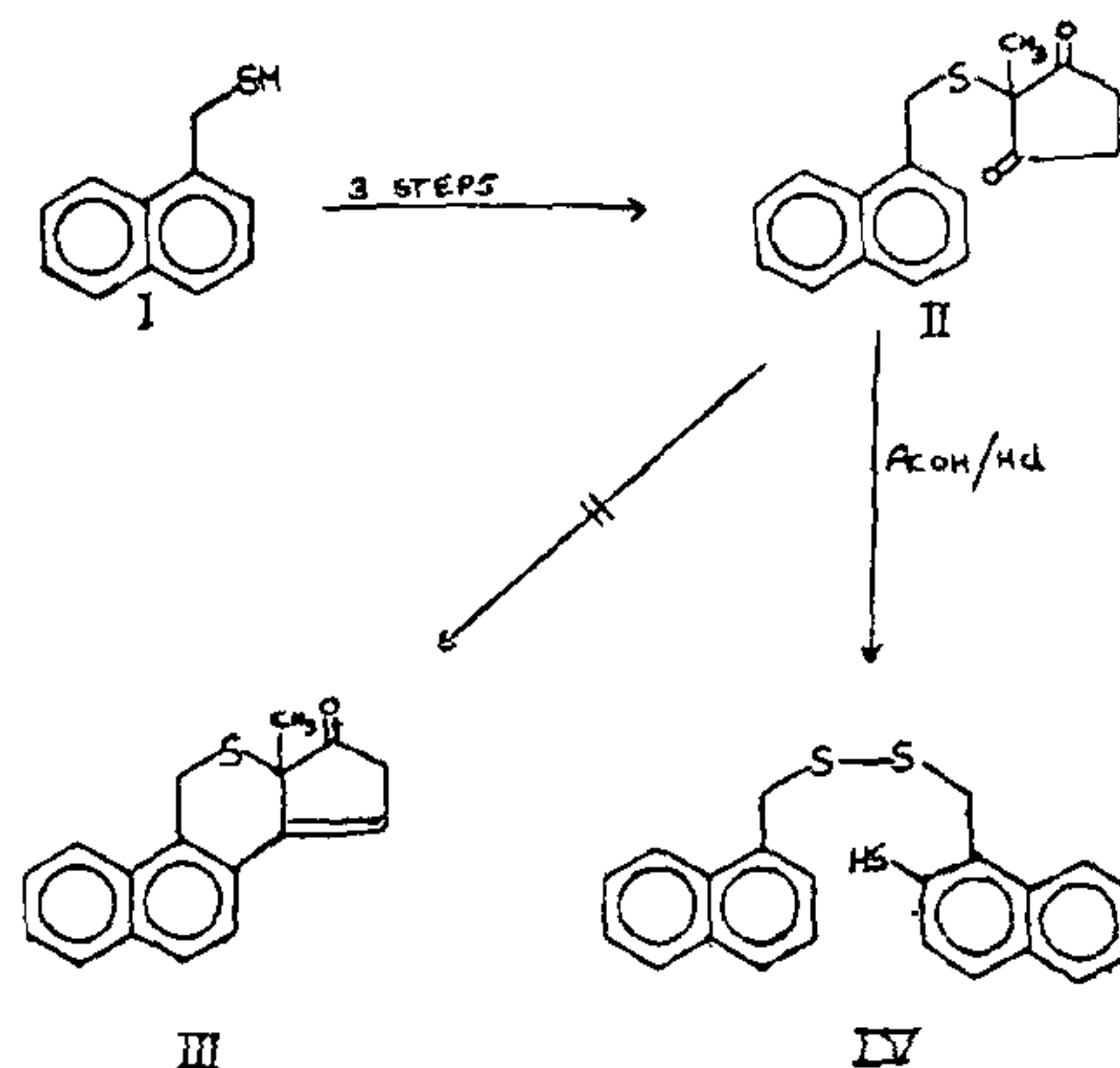
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A NOVEL DISULPHIDE FORMATION DURING THE CYCLODEHYDRATION OF 3-DEOXY-12-THIA-8,14-SECO-1,3,5(10),6,8- ESTRAPENTAEN-14,17-DIONE

RECENT reviews¹⁻⁴ on heterocyclic steroids indicate that there has been no report on the total synthesis and biological activity of 12-thiasteroids of aromatic and non-aromatic series. This prompted us to undertake the total synthesis of 3-deoxy-12-thia-1,3,5(10),6,8,14-estrapentaen-17-one(II) starting from 1-mercaptomethylnaphthalene(I)⁵.

Thus 3-deoxy-12-thia-8, 14-seco-1,3,5(10),6-8-estrapentaen-14,17-dione(II) was synthesized in three steps starting from 1-mercaptomethyl naphthalene as reported in our earlier communication⁶. Cyclodehydration of the secosteroid(II) employing the conventional catalysts such as methanolic hydrochloric acid, PTS in benzene, trifluoroacetic acid in chloroform, anhydrous SnCl₄ in benzene, etc., failed to furnish the anticipated steroid(III). However, attempted cyclodehydration of II with glacial acetic acid-hydrochloric acid (4 : 1) at 80-90°C for 8 hrs furnished, instead of the anticipated tetracyclic steroid, 1-naphthyl-methyl-2'-mercapto-1'-naphthylmethyl-disulphide(IV) as a

white crystalline solid, m.p. 134-35°, in 10% yield. The structure assigned to IV was evident from its spectral and analytical data; IR(CHCl₃): 2650 (W, SH), 1600, 1500 and 1400 cm⁻¹; ¹H NMR (CDCl₃);



1.5 (s, 1H, SH, proton), 3.9 (s, 2H, -CH₂-S-S-), 4.4 (s, 2H, -S-S-CH₂-), 7.8-8.2 (m, 13H, aromatic). The signal at 1.5 disappeared on shaking with D₂O and clearly indicated that it is an SH proton; ¹³C NMR (CDCl₃ δ): 44.04 (t, -CH₂-S-S), 44.32 (t, -S-S-CH₂-), (126.68-131.83) (aromatic carbons); Mass spectrum showed peaks at m/e 378 (M⁺, 2%), 232 (4%), 173 (6%), 171(5%), 142(10%), 141(100%); (Found C, 70.30, H, 5.13%. C₂₂H₁₈S₃ requires C, 69.84, H 4.76%).

The mechanism involving the formation of the product(IV) is under investigation.

P.Ch. thanks CSIR for giving financial help (JRF) and the Director of this Institute for providing research facilities.

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