points we found that for S12, S13, and S14, all from the Lake Tahoe area, it was conceivable that the paleomagnetic and radiometric samples came from different flows. To check this we have made a joint field trip to the collecting area and have found that in comparing our previous field notes for S13 we erred and sampled different flows only a few meters apart, one of which is normal and the other is reversed.

For S14, because of dislocations by frost riving at the radiometric sampling site, we collected samples at an undisturbed outcrop 2 km away. The two outcrops had previously been assigned to the same geologic formation (*6*) and they appeared to us to be from the same flow. On checking the radiometrically dated outcrop, we found that the directions of magnetization of multiple samples, although scattered as expectable from disturbance by frost, are all reversed. The polarity of S12 is of doubtful paleomagnetic significance because of its tendency toward self-reversal (*2*) and therefore this flow was not investigated further. For both S13 and S14 it is now clear that the paleomagnetic samples came from flows with normal polarities, whereas the radiometrically dated ones came from nearby reversed flows.

Even after these two data points are corrected, none of the published time scales (*1–3*) is consistent with all of the published data. Despite the remaining discrepancies, the main conclusions of our previous article still appear to us to be valid: the internal consistency of the data, especially among the younger flows, confirms the field reversal hypothesis and the younger polarity epochs are of the order of 1 million years long, although not of equal duration. Whether the remaining discrepancies are due to inaccurate dates, self-reversal, bad geologic correlation, or short polarity epochs can only be resolved by additional work.

The fact that independent investigations in California and Hawaii have enabled us to promptly identify an error of the type here described may serve as a convincing, though embarrassing, demonstration of the usefulness of paleomagnetism for precise world-wide stratigraphic correlation.

ALLAN COX
RICHARD R. DOELL
G. BRENT DALRYMPLE
U.S. Geological Survey,
Menlo Park, California

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High-Pressure Metallic Indium Telluride: Preparation and Crystal Structure

Abstract. *The metallic high-pressure form of indium telluride may be prepared under high pressure at 150°C and retained at ambient conditions without low-temperature quenching. It has the NaCl (type B1) structure with a cell edge of 6.160 ± .005 Å and a calculated density of 6.887* g/cm^3. *The density increase relative to the low-pressure polymorph is 15.6 percent.*

At 23 kb and ambient temperature, indium antimonide transforms to an electrically conducting polymorph (*1*, *2*) with the white tin structure (*2*, *3*, *4*). No direct evidence for the ordering of In and Sb in the white tin structure has been obtained because of the similar x-ray scattering power of In and Sb. Darnell and Libby (*3*) prepared the white tin form of InSb for study at ambient pressure by heating to about 100°C at pressures slightly greater than 23 kb, cooling with liquid nitrogen, and then releasing the pressure. The thermal metastability limit for metallic InSb at ambient pressure was reported to be −63°C. Darnell, Yencha, and Libby (*5*) subsequently prepared a high-pressure metallic polymorph of InTe above 32 kb by the same technique used for the preparation of InSb and found that it could be retained metastably at ambient pressure below 125°C. The reported large difference between the thermal metastability limits of metallic InSb and InTe led us to attempt the preparation of metallic InTe without subambient quenching. Finely powdered (−325 mesh) tetragonal InTe was subjected to 50 kb at 150°C in a belt-type apparatus (*6*) for 1 hour. The sample was quenched to ambient temperature while under pressure and the pressure was then released. Essentially complete conversion to the cubic blue metallic phase described by Darnell, Yencha, and Libby (*5*) was obtained. The product was a compact cylinder 0.96 cm in diameter and 0.85 cm high. After 3 days at ambient conditions, the metallic InTe was ground in a mortar to −325 mesh. X-ray powder-diffraction data showed that there was no transformation to the low-pressure form. The high-pressure form of InTe may thus be readily prepared and retained for laboratory study.

Indium arsenide and InP are transformed under pressures of 100 and 125 kb, respectively, at ambient temperature to electrically conducting high-pressure polymorphs with the NaCl structure (*4*, *7*). In addition, the ambient-pressure forms of SnTe and SnSb and of several rare-earth tellurides and antimonides (for example, NdTe, NdSb, PrTe, and PrSb) are reported to have the NaCl structure with cell edges between 6.14 Å and 6.36 Å (*8*). At ambient temperature, SnSb has a slightly deformed NaCl structure and is rhombohedral with $\alpha = 89°38'$ (*9*). Metallic InTe gives an x-ray powder diffraction pattern which may be indexed on a simple cubic cell with $a_0 = 3.07$ Å (*5*). Doubling of this cell permits indexing of the pattern as face-centered cubic and the relative intensities of the reflections are compatible with the NaCl structure (Table 1). The reflections for which the indices are all odd (111, 311, 331, and 511), however, are missing because of the similar scattering power of In and Te. Goryunova, Radautsan, and Kiosse (*10*) have studied the ambient-pressure phases in the In-Sb-Te system by x-ray powder-diffraction methods. They confirmed that InSb has the sphalerite structure with $a_0 = 6.47$ Å as reported by earlier workers (*11*) and concluded that (i) the composition range (3 InSb·In-Te-InSb·3 InTe) is a two-phase region composed of a cubic phase with the sphalerite structure and a cubic phase with the NaCl structure and that the percentage of the latter increases as the Te-rich composition is approached, (ii) the composition (InSb·3 InTe) is a single phase with the NaCl structure and $a_0 = 6.13$ Å, and (iii) InTe has a relatively low-symmetry structure. Their interplanar spacings for [InSb·3 InTe] are essentially coincident with those of the high-pressure form of InTe and reflections with all indices odd are absent. Their x-ray data for the ambient-pressure form of InTe are in agreement

Table 1. X-ray powder diffraction data for the high-pressure form of InTe (Mn-filtered FeKα radiation, 57.3-mm camera).

hkl	$d_{obs.}$ Å	$I_{obs.}$ *	$I_{calc.}$ †
200	3.07	100	100
220	2.17	80	74
222	1.77	25	24
400	1.53	15	13
420	1.37	45	37
422	1.254	35	34
440	1.086	20	19
442 600	1.024	50	69

* $I_{obs.}$ = visually estimated relative intensities. † $I_{calc.}$ = calculated relative intensities for InTe with the NaCl structure.

with those given for tetragonal InTe by Darnell, Yencha, and Libby (*5*) and by Schubert, Dörre, and Kluge (*12*). We conclude that the high-pressure cubic form of InTe has the NaCl (type B1) structure.

The cell edge of our metallic InTe is 6.160 ± 0.005 Å based on x-ray powder diffraction data, obtained with V-filtered CrKα radiation and a 57.3-mm camera, extrapolated to $\theta = 90°$ from the function

$$\frac{1}{2}\left(\frac{\cos^2\theta}{\sin\theta}+\frac{\cos^2\theta}{\theta}\right)$$

The corresponding calculated density of metallic InTe is 6.887 g/cm³. The measured density determined pycnometrically was 6.84 g/cm³. The density increase relative to the low-pressure tetragonal form (*12*) is 15.6 percent. The interatomic distance In-Te is 3.08 Å. The sum of the single-bond metallic radii given by Pauling (*13*) for In (1.42 Å) and Te (1.37 Å) is 2.79 Å. This distance may be corrected for sixfold coordination of In and Te by using Pauling's valence of 2 for metallic tellurium and the relationship $D(n = \frac{1}{3}) = D(n = 1) - 0.6 \log n$, where D is the interatomic distance and n is the bond number (*13*). The corrected value is 3.08 Å in exact agreement with the experimental value.

Schubert *et al.* (*12*) showed that the low-pressure tetragonal form of InTe has the TeSe (type B37) structure, in which half the indium atoms are tetrahedrally coordinated and half are hexahedrally coordinated with tellurium. The high-pressure phase transition in InTe, therefore, involves a reconstructive transformation of first coordination in which the coordination of indium with respect to tellurium changes from 4 and 8 to 6.

On a pressure-temperature-composition equilibrium diagram of the InSb-InTe system, the stability region for the phase with the NaCl structure must be bounded by a curved surface which intersects the *P-T* plane in a straight line between 13 kb at 700°C and 32 kb at 0°C (*14*), and intersects the *T-X* plane at the composition (InSb·3 InTe).

After this paper was submitted for publication, the contribution of Banus *et al.* (*14*) appeared. Our findings regarding preparation of metallic InTe without subambient quenching and our conclusion that it has the NaCl structure are in complete agreement with their work (*14*). We do not agree with their statement that the x-ray data of Darnell *et al.* (*5*) can be interpreted as having the CsCl structure, because the intensities are wholly incompatible with this structure. Furthermore, it is impossible for InTe to have the CsCl structure with a cell edge of 3.07 Å and one formula weight per cell, giving a calculated density of 13.8 g/cm³ as discussed by Banus *et al.* (*14*), because the (100) reflection for InTe with the CsCl structure would approach zero intensity whereas the reflection at 3.07 Å is the strongest line of the cubic InTe pattern. Banus *et al.* (*14*) use SnTe as an example of an analogous compound whose structure is "known" to be that of NaCl. Whether SnTe has a simple cubic or the NaCl structure, however, is as equivocal as the arguments regarding the structure of metallic InTe because of the essentially equivalent x-ray scattering power of Sn and Te. The x-ray data for both compounds are compatible with either a simple cubic or NaCl structure. Because of the existence of high-pressure forms of InAs and InP, which reportedly have the NaCl structure (*4, 7*) presumably on the basis of observed reflections with all indices odd, we conclude that the weight of evidence favors the NaCl (Bl) structure for metallic InTe.

C. B. SCLAR
L. C. CARRISON
C. M. SCHWARTZ
Battelle Memorial Institute,
Columbus 1, Ohio

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Cretaceous Fossils Collected at Johnson Nunatak, Antarctica

Abstract. *Sandstone samples collected at 74°52′S, 74°02′W have been assigned a Cretaceous age on the basis of a faunal assemblage including* Rotularia callosa *(Stoliczka).*

Rock specimens were collected at 11 locations on the Antarctic Peninsula Traverse, 1961–62 (*1*). At one location, Johnson Nunatak (*2*), located at 74°52′S, 74°02′W, samples of a fossiliferous marine sandstone were

Fig. 1. *Rotularia callosa* (Stoliczka) fossils from Johnson Nunatak (1.6 times natural size).