Table 1. *X-ray diffraction data for* Nb_2Al

hkl	d_o (Å)	d_c (Å)	Relative intensity
101	4·599	4·599	*w*
210	4·448	4·447	*w*
111	4·171	4·174	*vw*
220	3·520	3·515	*vw*
211	3·376	3·376	*vw*
310	3·145	3·144	*w*
301	2·792	2·793	*w*
002	2·591	2·593	*w*
410	2·412	2·412	*vs*
330	2·342	2·344	*s*
202	2·305	2·299	*s*
212	2·238	2·240	*vs*
411	2·187	2·187	*vs*
331	2·137	2·136	*m*
222	2·083	2·087	*w*
312	1·998	2·001	*w*
432	1·577	1·578	*w*
522	1·503	1·504	*m*
532	1·425	1·425	*m*
710, 550, 413	1·404	1·406	*m*
333	1·389	1·391	*w*
720, 423	1·366	1·366	*m*
622	1·344	1·344	*vw*
542	1·334	1·332	*vw*
721	1·321	1·321	*vw*
513	1·292	1·294	*vw*
304	1·206	1·206	*w*
324	1·174	1·173	*w*
414	1·139	1·142	*m*
812, 742	1·114	1·114	*w*
553, 713	1·089	1·091	*vw*

alloys, obtained with Cu $K\alpha$ radiation ($\lambda = 1{\cdot}5418$ Å) showed that the 24·4 atomic per cent aluminum alloy consisted of Nb_3Al with a small amount of Nb_2Al, the 28·8 atomic per cent aluminum alloy consisted of nearly equal amounts of Nb_3Al and Nb_2Al, and the 34 atomic per cent aluminum alloy consisted of Nb_2Al. The diffraction pattern of Nb_3Al was identical to that reported by Wood *et al.* (1958).

The observed X-ray diffraction data and calculated interplanar spacings for the Nb_2Al phase are shown in Table 1. The pattern could be indexed as tetragonal with $a_0 = 9{\cdot}943$ Å, $c_0 = 5{\cdot}186$ Å, $c/a = 0{\cdot}522$. The cell dimensions and relative intensities of the diffraction lines suggest a structure of the sigma type, which has 30 atoms per unit cell (Bergman & Shoemaker, 1955). The calculated density of the 34 atomic per cent aluminum alloy, assuming 30 atoms per unit cell, is 6·85 g.cm.$^{-3}$, in good agreement with the measured density of 6·87 g.cm.$^{-3}$.

This preliminary survey established the existence of the intermediate phase Nb_2Al. The structure is tetragonal and appears to be of the sigma type. If so, this niobium–aluminum phase should be of exceptional theoretical interest since all presently established binary sigma phases are composed of two transition elements from the Long Periods (Knapton, 1958).

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Books Received

The undermentioned works have been received by the Editors. Mention here does not preclude review at a later date.

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