crystals. No crystallographic details regarding $Cr(NO_3)_3 . 9H_2O$ have been reported so far. Crystals of $Cr(NO_3)_3 . 9H_2O$ have also been grown in a similar manner and have been found from X-ray study to be isomorphous with $Al(NO_3)_3 . 9H_2O$. Transparent but slightly coloured mixed crystals of $Al(NO_3)_3 . 9H_2O$) diluted with $Cr(NO_3)_3 . 9H_2O$ were also grown.

For X-ray investigation crystals were ground cylindrical to about 0·25 mm diameter. As they were highly hygroscopic they were first soaked in kerosine and enclosed and sealed inside Lindemann glass capillaries. Rotation and Weissenberg photographs taken about the crystallographic axes established the crystals to be monoclinic with a tetramolecular unit cell of the dimensions recorded in Table 1.

Table 1. *Crystal data for* $Al(NO_3)_3 . 9H_2O$ *and* $Cr(NO_3)_3 . 9H_2O$

	$Al(NO_3)_3 . 9H_2O$	$Cr(NO_3)_3 . 9H_2O$
a	13·901 ± 0·015 Å	13·915 ± 0·015 Å
b	9·636	9·681
c	10·903	10·983
β	84°48′	*84°16′
V	1454·4 Å^3	1474·07 Å^3
D_m	1·714 g.cm^{-3}	1·796 g.cm^{-3}
D_x	1·713 g.cm^{-3}	1·802 g.cm^{-3}
Z	4	4
μ	24·92 cm^{-1}	78·92 cm^{-1}

* β* measured from first layer c-axis photograph by Buerger's (1942) offset method.

Density was determined by flotation, with a mixture of carbon tetrachloride and bromoform.

The systematic absences observed are:

hkl	no conditions
$h0l$	$l = 2n$ present
$0k0$	$k = 2n$ present

Hence the space group is $P2_1/c$.

In the case of $Al(NO_3)_3 . 9H_2O$ the matrix of transformation of the present axes to those given by Groth is

$$\begin{bmatrix} 1 & 0 & \bar{1} \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$$

The principal refractive indices of the crystals, measured by the oil immersion method for $\lambda = 5893$ Å at room temperature, are given in Table 2.

Table 2. *Refractive indices of* $Al(NO_3)_3 . 9H_2O$ *and* $Cr(NO_3)_3 . 9H_2O$

Refractive indices	$Al(NO_3)_3 . 9H_2O$	$Cr(NO_3)_3 . 9H_2O$
α	1·399 ± 0·001	1·423 ± 0·001
β	1·514	1·532
γ	1·525	1·541
$2V$	34° ± 2°	36° ± 2°

The crystals are optically negative with dispersion violet > red.

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X-ray interference fringes in Berg-Barrett diffraction patterns.

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The interference pattern observed in the Berg–Barrett diffraction pattern of zinc crystals (Armstrong & Schultz, 1964) is interesting. An explanation in terms of Pendellösung effect and the anomalous transmission of X-rays has been given but the authors themselves state that 'the relatively high imperfection content of the zinc crystals makes the observation of interference fringes and anomalous transmission of X-rays unexpected'.

A different explanation seems plausible. Interference between the diffracted beams from two different regions of a crystal, or even from two separate crystals, has been extensively reported with electron beams and a systematic application of this effect for the design of electron-beam interferometers has been discussed. (For a review see Gabor, 1956).

Similarly, the interference of the Bragg-reflected X-ray beams from two regions of the crystal which are slightly misoriented could occur. The optical conditions for such an interference to occur are that (1) the 'coherence length', usually expressed as $\lambda^2/\Delta\lambda$ where λ is the mean wavelength of the characteristic radiation and $\Delta\lambda$, the inherent spectral width, should be small in comparison with the path difference between the two beams and (2) the angle between the interfering wavefronts, $\beta = \lambda/y$ where y is the fringe spacing, should be so small that the fringe spacing can be resolved by the recording instrument. In the present experiment the coherence length turns out to be about 3650 Å taking $\Delta\lambda = 1{\cdot}03$ X.u as the mean width of the iron $K\alpha$ radiation (Compton & Allison, 1935). Taking their observed fringe spacing of the order of 3 microns, the angle β is estimated as about 13 seconds of arc. In the crystal, regions with such a separation and angle of misorientation are reasonably possible when the perfection is only moderate and the interference of the diffracted beams from two such regions seems to be the indicated explanation.

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