

## Comments on the Lifshitz conditions

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It is known that there are many phase transitions triggered by irreducible representations which are inactive from the viewpoint of the Lifshitz condition.

We examine this feature by studying concretely the Fourier-transformed dipole interaction matrix based on the model which reflects the symmetry aspect of the Rochelle salt crystal.

## On the Phase Transition of $K_2SeO_4$

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It seems almost certain that the M phase of  $K_2SeO_4$  belongs to  $Pna2_1$  ( $C_{2v}^9$ ), though the crystal lacks the evidences of the polar nature. This apparent contradiction can be solved by assuming that the high temperature phase of the crystal belongs to  $D_{6h}^4$ , and the M phase arises as the greatest common measure of two orthorhombic non-polar phases  $D_{2h}^{16}$  and  $D_{2h}^{14}$  which are, respectively, induced by the modulations of the wave vectors  $k = \frac{1}{2} a_2^*$ , and  $k = \frac{1}{2} a_2^* + \frac{1}{3} a_3^*$ .