This dissertation is the report of the work done by the author during December, 1968 to July, 1974. Certain aspects of the phonon scattering in solids from both experimental and theoretical points of view were studied. Even though some work was done on dielectric crystals, the main emphasis is on metallic systems. In the theoretical work reported here, no attempt was made to develop a sophisticated theory but using the simplest methods that are reasonably valid, the experimentally measurable quantities have been calculated. The first Chapter gives an overall picture of the thesis with an emphasis on the authors work.

At the end of each Chapter, a list of references is provided. The author is aware that the list is by no means complete. Only the works that the author had to consult during the course of work have been cited as references. Most of the results that are presented in this thesis have been published in journals and conference reports. For ready reference a list of publications is provided in the following:

1. Effect of Crystal Rotation on Quadrupolar T.

3. A Mechanism for Nuclear Spin-Phonon Coupling, 
Proceedings of the International Conference on 
Phonon Scattering in Solids, Paris, 1972 (Co-author 
S. K. Ghatak).


6. Ultrasonic Propagation in Dilute Magnetic Alloys, 
S. K. Ghatak).

7. Approximate Analytic Representation for the Conduction 
(Co-author S. Kumar).

8. Electron Mediated Nuclear Spin-Phonon Interaction in 
Metals, Proceedings of the V International Symposium 
on Magnetic Resonance, Bombay, 1974 (Co-author S. K. 
Ghatak).

9. Acoustic NMR of Spin 3/2 Systems in Cubic Crystals, 
Proceedings of the V International Symposium on Magnetic 
Resonance, Bombay, 1974 and communicated to J. Mag. Res. 
(Co-author S. K. Sinha).

10. Acoustic NMR in Metals, Proceedings of the V International 
Symposium on Magnetic Resonance, Bombay, 1974 (Co-author 
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