Investigation of ohmic contact to P-type CdTe:P using ac and dc techniques

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Abstract
The effect of ohmic contact to P-type CdTe:P single crystal has been studied for different back contacts. Au and graphite doped with Cu, Te, and CdCl₂. The ac electrical measurements were performed at room temperature in the frequency range 10⁻¹ Hz to 10⁶ Hz. The results were compared with dc measurements at the same temperature. Al/CdTe:P Schottky diodes were fabricated using thermal evaporation technique. The same applies for Au back contacts while for the others, Cu, Te and CdCl₂ powder forms were mixed in fixed portions with graphite. In ac and dc measurements, it was found that Cu electrodes give the lowest contact resistance which is nearly frequency independent in a frequency range 10⁻¹ Hz to about 10³ Hz. However, the plot of the imaginary component (Z″) versus the real component (Z′) of the complex ac impedance yields two semi-circles in the case of Cu and Te back contacts with less defined two semi-circles in the case of CdCl₂.