

# An Investigation of the Structure of Amorphous Co-P Alloys.

## 1: X-ray and Neutron Diffraction

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Amorphous Co-P alloys with different phosphorous concentrations were produced by melt-spinning, sputtering, and electrodeposition. From the combination of X-ray and neutron diffraction the atomic distances and coordination numbers for the Co-Co- and the Co-P correlations were determined. The short range structure, in dependence of the P-concentration,  $9 \text{ at\% P} \leq c_P \leq 26 \text{ at\% P}$ , exhibits rather abrupt changes at the eutectic composition,  $c_{P,e} = 19.9 \text{ at\% P}$ . It is suggested that at P-contents above  $c_{P,e}$  the short range order is more pronounced than at lower P-contents. The coordination of nine Co atoms around P, as established previously for many transition metal-metalloid glasses, is found only at the eutectic composition. There is almost no dependence of the structure of the amorphous alloys on the specific production method. It is indicated that the melt-spun and the sputtered glasses are in a slightly more relaxed state than the electrodeposited glasses.

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