Aufgabe 5-1:

The powder pattern of aluminum, made with Cu kα radiation, consists ten lines, whose $sin^2\theta$ values are 0.1118, 0.1487, 0.294, 0.403, 0.439, 0.583, 0.691, 0.727, 0.872, and 0.981.

Index these lines and calculate the lattice parameter.

Aufgabe 5-2:

A pattern is made of a cubic substance with unfiltered chromium radiation. The observed $sin^2\theta$ values and intensities are 0.265(m), 0.321 (vs), 0.528 (w), 0.638(s), 0.793(s), and 0.958(vs).

(a) Index these lines and state which are due to k_α and which to k_β radiation.
(b) Determine the Bravais lattice and lattice parameter. Identify the substance by reference to Appendix 13.

Aufgabe 5-3:

The powder pattern of an element of cubic structure is represented by the observed $Sin^2\theta$ values of the first eight lines on the pattern, made with Cu kα radiation.

line	$Sin^2\theta$
1	0.0603
2	0.1610
3	0.221
4	0.322
5	0.383
6	0.484
7	0.545
8	0.645

(a) Index the lines and find the corresponding Brava's lattice.
(b) Approximate lattice parameter, and identify the element from the tabulation given in Appendix 13.