

Use Table I as needed. Table I gives the energies of certain absorption edges and characteristic radiation from several elements and mass absorption coefficients of Cu $K\alpha$ for these elements. Note that some values are in energy (eV) and others in wavelength (Å).

1. Calculate the energy (eV) of the $K\alpha$ x-ray for Ti. ANS _____
2. Calculate the binding energy of the M shell electron (ignore sub-shells) for V. ANS _____
3. Calculate the transmission coefficient (I_x/I_0) of a MoZn alloy 0.1 cm thick for Cu $K\alpha$ radiation. Assume that the alloy contains 40% Mo and 60% Zn by weight and has a density of 8.3 g/cm³.

TABLE I

atom-atomic # Density (g/cm ³)	$K\alpha$ (eV)	$L\alpha$ (Å)	$L\alpha$ (eV)	K edge (Å)	K edge (eV)	L edge (Å)	L edge (eV)	μ_m of Cu $K\alpha$ (cm ² /gm)
Ti – 22 4.51		27.42	452	2.497	4966	27	459	202.4
V – 23 6.09	4950	24.25	511	2.27	5463	24.2	513	222.6
Cu - 29 8.93	8052	13.34	930	1.38	8985	13.29	933	51.5
Zn – 30 7.13	8632	12.25	1012	1.283	9665	12	1033	59.5
Mo – 42 10.22	17552	5.41	2292	0.619	20032	5	2480	158.3

4. Using Table 1 again, calculate the depth of penetration of a Cu $K\alpha$ xray into Mo at which there is a 60% loss of the intensity.