size was reported for Al–Zn thin films by Abd EL-Salam *et al* (1997).

3.2 *Optical properties*

The optical transmittance and reflectance of CdO thin films were recorded as a function of photon energy ranging from 350–850 nm for three different samples and is shown in figure 4. It can be seen from the spectra that a transmission of 77% was observed for films of thickness and 400 nm. A lower transmission of 73% was observed for a 600 nm film. The absorption coefficient was determined from the transmittance data using the formula (Van der Pauw 1985), $\alpha = 2{\cdot}303 \times \ln(1/T)$. The estimated α values were ranging from $2{\cdot}81$–$3{\cdot}20 \times 10^4$ at a wavelength of 500 nm, which are in consistent with the earlier reported values (Subramanyam 1997). For a direct transition, the absorption coefficient is related to band gap by the equation

$$\alpha(h\nu) = A(h\nu - E_g)^{1/2},$$

where A is a constant. Figure 5 shows the plot of $(\alpha h\nu)^2$ vs $h\nu$. The band gap was evaluated by extrapolating the linear portion of $(\alpha h\nu)^2$ vs $h\nu$ plot to the energy axis. The

Table 1. Comparison of 2θ, d, I/I_0 and hkl values of CdO thin films to that of standard bulk CdO.

		'd' spacing (10^{-10} m)		I/I_0		
Peak no.	$2\theta°$	Observed	Standard	Observed	Standard	hkl
1	32·98	2·714	2·712	100	100	111
2	38·32	2·347	2·347	25	88	200
3	55·20	1·663	1·661	13	43	220
4	66·00	1·414	1·416	9	28	311
5	69·22	1·356	1·355	11	13	222

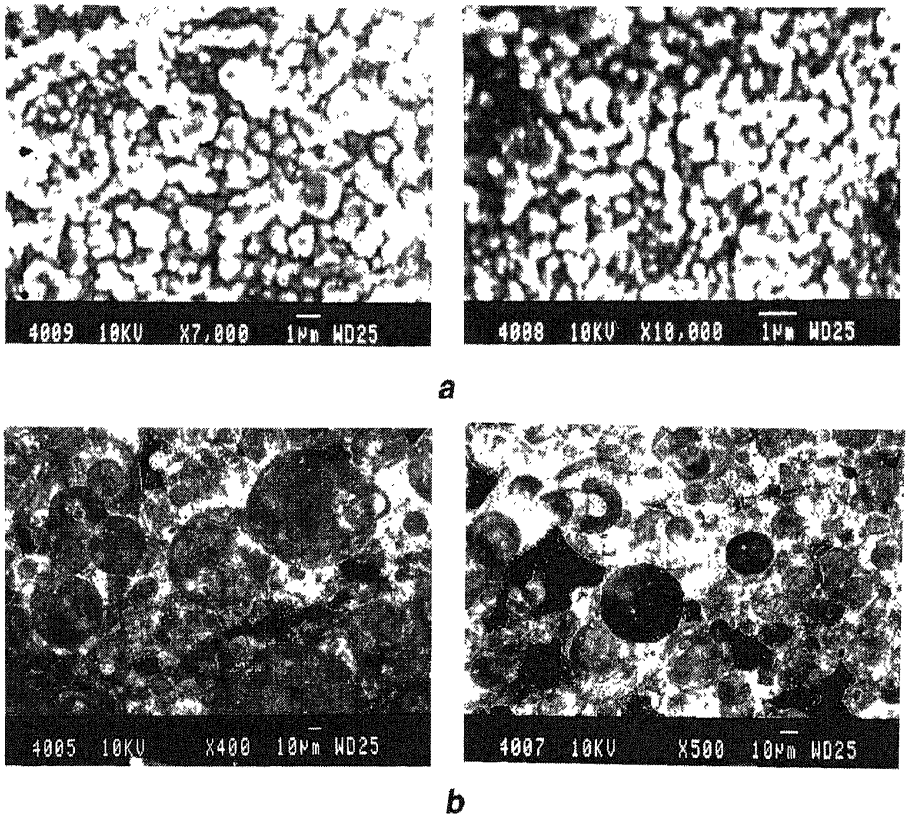

Figure 3. Scanning electron micrographs showing the surface topography of sprayed CdO thin films. Film thicknesses (**a**) 200 nm and (**b**) 600 nm.