Mechanochemical transformation of Pb2MoO5 single crystal into nano-dispersed state

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Pb2MoO5 single crystals are considered as a very attractive material for application in acoustooptical devices, such as modulators, detectors and filters operating over the visible and middle infrared spectral regions. On the other hand, as a semiconductor, it is promising for application in photocatalysis in a nano-dispersed state. Therefore, transformation of its single crystal into nanosized state is an important scientific and applied task. Such transformation is possible by means of mechanochemical treatment (MChT).



	m^2/g	eV	$10^5, s^{-1}$
MChT air 500	1.93	2.53	2.00
MChT air 500 rpm with 5%Bi ₂ O ₃	2.78	2.51	6.50
MChT air 500 rpm with 5% Bi_2O_3 + MChT H ₂ O 5 min	3.50	2.78	1.70

S-specific surface area; Eg-band gap

 K_d - the rate constant degradation of safranin T

light and has band gap of about 2.5-2.6 eV, it was tested as photocatalyst in process of dyes (safranin T) degradation under visible irradiation. All milled samples exhibited photocatalytic activity under these conditions. Milled Pb₂MoO₅ nanopowder doped with 5% of bismuth oxide shown maximum activity.