Potassium Dihydrogen Phosphate (KDP) and Potassium Dideuterium Phosphate (DKDP or KD*P)

Introduction

Potassium Dihydrogen Phosphate (KDP) and Potassium Dideuterium Phosphate (KD*P) are among the most widely-used commercial NLO materials, characterized by good UV transmission, high damage threshold, and high birefringence, though their NLO coefficients are relatively low. They are usually used for doubling, tripling and quadrupling of a Nd:YAG laser under the room temperature. In addition, they are also excellent electro-optic crystals with high electro-optic coefficients, widely used as electro-optical modulators, such as Q-switches, Pockels Cells, etc.

CASTECH's KDP & KD*P products

CASTECH supplies high quality KDP and KD*P crystals in large quantities for these applications. Because their polished surfaces are easier to be moistened, the user is advised to provide the dry condition (<50%) and the sealed housing for preservation. For this purpose, **CASTECH** also provides polishing and sealed housing services for the KDP family crystals. Our engineers will serve you to select and design the best crystal, according to the laser parameters you provide.

Basic Properties

	KDP	KD*P
Chemical Formula	KH_2PO_4	KD_2PO_4
Transparency Range	200-1500nm	200-1600nm
Nonlinear Coefficients	d_{36}=0.44pm/V	d_{36}=0.40pm/V
Refractive Index (at 1064nm)	n_o=1.4938, n_e=1.4599	n_o=1.4948, n_e=1.4554
Electro-optical Coefficients	r_{41}=8.8pm/V r_{63}=10.3pm/V	r_{41}=8.8pm/V r_{63}=25pm/V
Longitudinal Half-wave voltage:	V_π=7.65KV(λ=546nm)	V_π=2.98KV(λ=546nm)
Absorptance:	0.07/cm	0.006/cm
Optical Damage Threshold:	>5 GW/cm^2	>3 GW/cm^2
Extinction Ratio:		30dB
Sellmeier Equations of KDP: (λ in μm)		
$n_o^2 = 2.259276 + 0.01008956/(\lambda^2 - 0.012942625) + 13.00522\lambda^2/(\lambda^2 - 400)$ $n_e^2 = 2.132668 + 0.008637494/(\lambda^2 - 0.012281043) + 3.2279924\lambda^2/(\lambda^2 - 400)$		
Sellmeier Equations of DKDP: (λ in μm)		
$n_o^2 = 1.9575544 + 0.2901391\lambda^2/(\lambda^2 - 0.0281399) - 0.02824391\lambda^2 + 0.004977826\lambda^4$ $n_e^2 = 1.5005779 + 0.6276034\lambda^2/(\lambda^2 - 0.0131558) - 0.01054063\lambda^2 + 0.002243821\lambda^4$		