

**TL CaSO<sub>4</sub>:Dy,P(KCT-300)**

**Development of New CaSO<sub>4</sub>:Dy,P(KCT-300) TL Pellets**

150

가  
 Teflon  
 TL 가 ,  
 300) Teledyne 6

가  
 Teflon  
 CaSO<sub>4</sub>:Dy TL 가  
 CaSO<sub>4</sub>:Dy,P TL (KAERI CaSO<sub>4</sub>:Dy,P TLD : KCT- Teledyne CaSO<sub>4</sub>:Dy Teflon

CaSO<sub>4</sub>:Dy TL  
 가  
 P CaSO<sub>4</sub>:Dy

**Abstract**

CaSO<sub>4</sub>:Dy thermoluminescence dosimeter(TLD) is widely used as a personal or environmental dosimeter because of its high sensitivity to radiation. There are many methods to make pellets from the TL powders, sintered disk type dosimeter mixing with Teflon as a bonding material is the most common method. But this method has disadvantage that CaSO<sub>4</sub>:Dy pellet does not have very high sensitivity because of large amounts of Teflon. This paper developed a new type of CaSO<sub>4</sub>:Dy pellets (KAERI CaSO<sub>4</sub>:Dy,P TLD : KCT-300) by using P compounds as a bonding material in CaSO<sub>4</sub>:Dy powder, and compared the radiation sensitivity with that of the commercialized Teledyne CaSO<sub>4</sub>:Dy pellets. New developed KCT-300 shows about six times higher sensitivity than Teledyne ones, and can be used to measure very low radiation dose.

1.

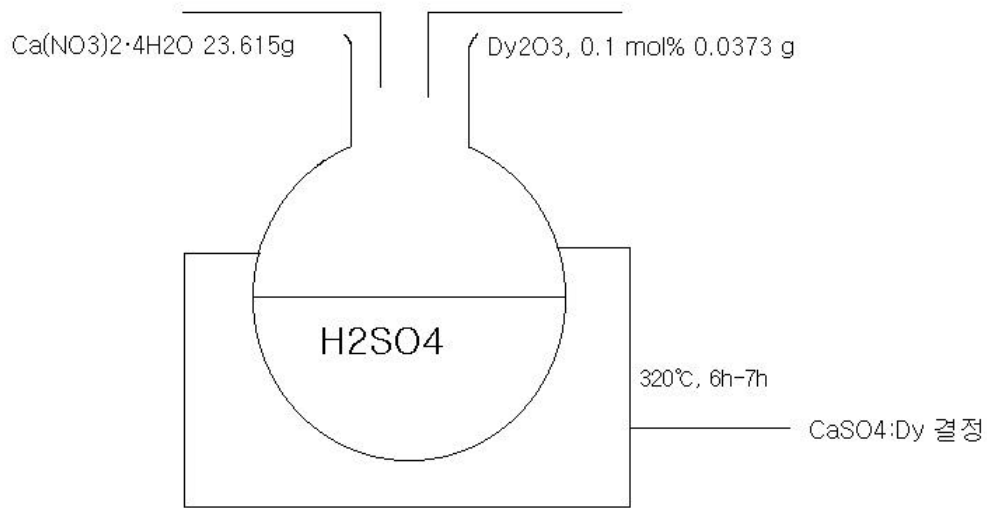
CaSO<sub>4</sub>:Dy TL TL CaSO<sub>4</sub>:Dy TL [1], Teflon

CaSO<sub>4</sub>:Dy Teflon TL  
 (15-30wt%) CaSO<sub>4</sub>:Dy 가  
 CaSO<sub>4</sub>:Dy TL . CaSO<sub>4</sub>:Dy Teflon 가  
 [2,3] CaSO<sub>4</sub>:Dy Teflon 가  
 M. Prokic[4]  
 CaSO<sub>4</sub>:Dy (multi-component inorganic binder) ,  
 TL 가  
 CaSO<sub>4</sub>:Dy P 가  
 CaSO<sub>4</sub>:Dy TL  
 Teflon .

**2. KCT-300**

**CaSO<sub>4</sub>:Dy TL**

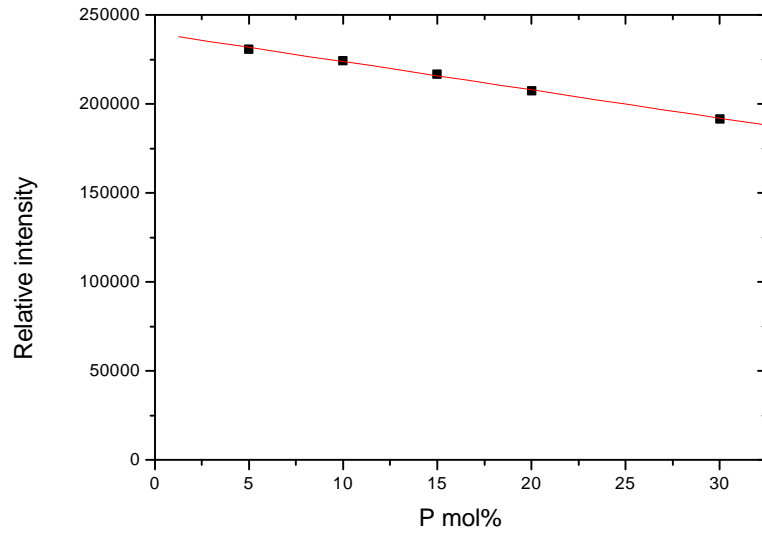
CaSO<sub>4</sub>:Dy TL Yamashita[5] . Ca(NO<sub>3</sub>)<sub>2</sub> 4H<sub>2</sub>O  
 H<sub>2</sub>SO<sub>4</sub> (extra pure) (Oriental Chemical Industries)  
 . 0.0373g Dy<sub>2</sub>O<sub>3</sub>(0.1mol%) ml 250ml  
 23.615g Ca(NO<sub>3</sub>)<sub>2</sub> 4H<sub>2</sub>O .  
 가 320 가 , CaSO<sub>4</sub>:Dy  
 가 200  
 700 1 CaSO<sub>4</sub>:Dy TL  
 1 TL .



Washing, drying, grinding, sieving 750°C, 2h  
 100~200 μm CaSO<sub>4</sub>:Dy TL 분말

**1. CaSO<sub>4</sub>:Dy TL**





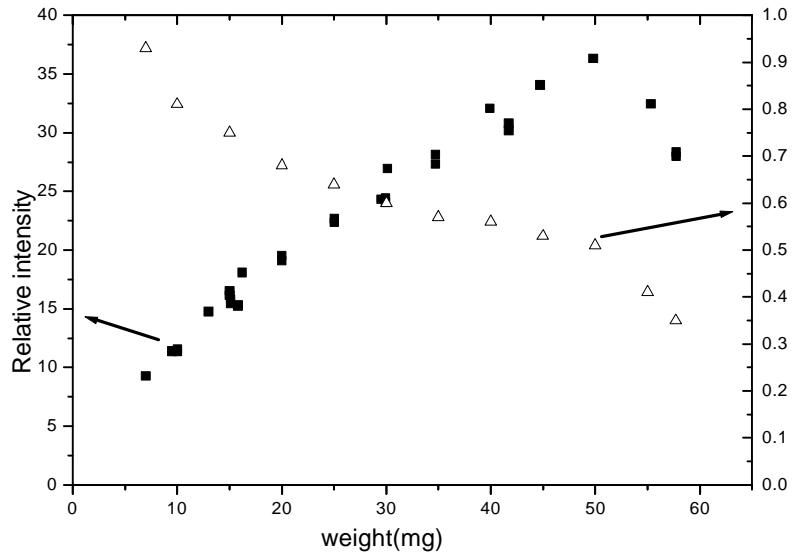
3.

**KCT-300**

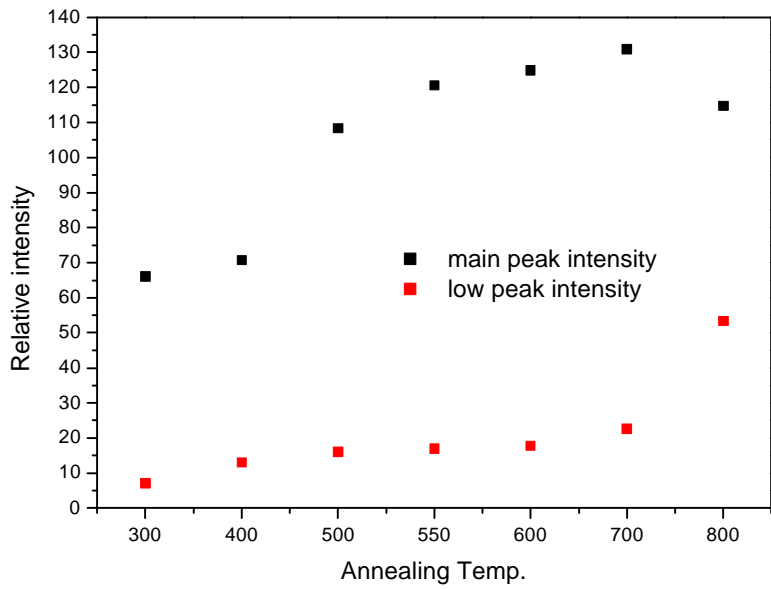
4 10mol% TL  
 50mg 가 TL 가 50mg  
 TL 가 가 가  
 20mg-30mg( 0.65-1.0mm)

**KCT-300**

(NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>) 63-100μm 10mol%  
 가 TL (cold  
 pressing) 4.5mm, 0.8mm, 25.0mg  
 100 MPa 가  
 . KCT-300  
 300 800 30  
 . 5 KCT-300  
 . 5 , 400 가  
 . 700 500 -700 가 가  
 . 700 가 600 , 30

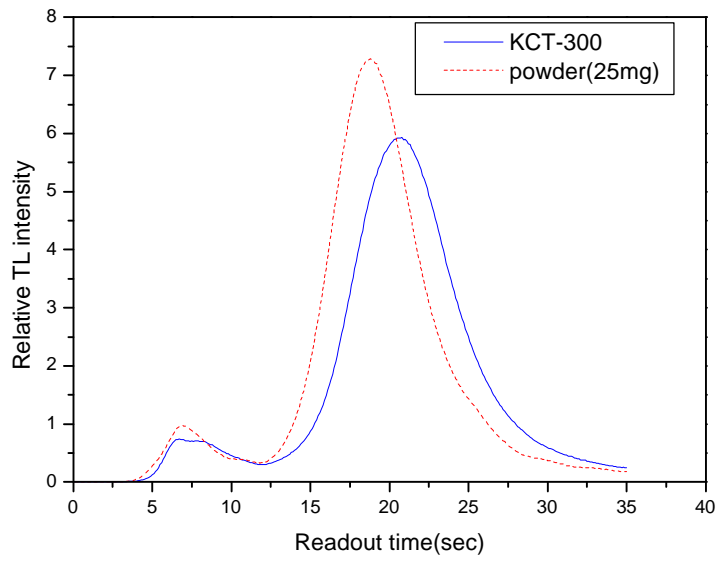


4. KCT ( : 10mg ) TL  
 ( : 1 )

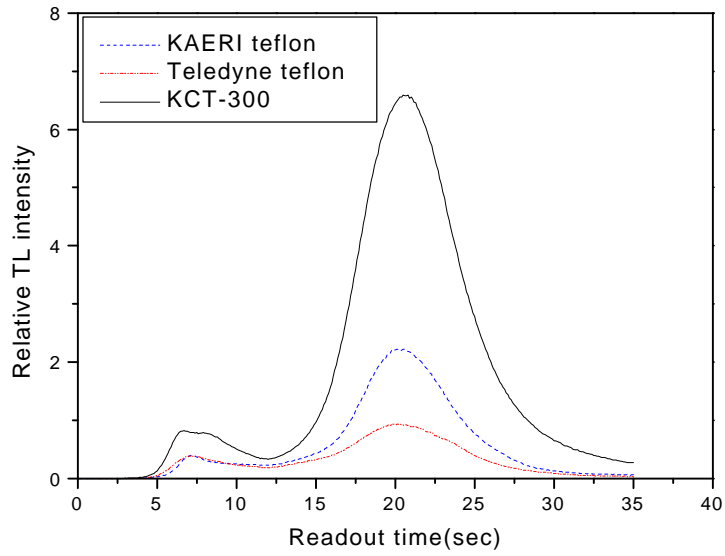


5. KCT-300

**KCT-300 TL**  
 KCT-300 0.8mm, 25mg,  
 4.5mm ,  
 700 , 1h  
 25mg . 6 KCT-300 CaSO<sub>4</sub>:Dy  
 KCT-300 ,  
 90%  
 7 KCT-300 Teflon  
 CaSO<sub>4</sub>:Dy Teflon , KAERI  
 Teledyne . Teflon 0.4mm, 14mg,  
 4.5mm KCT-300 가  
 Teflon 가 KCT-300 Teledyne  
 Teflon 6 .



6. KCT-300 CaSO<sub>4</sub>:Dy



7. KCT-300 Teflon

3.

CaSO <sub>4</sub> :Dy		P	가	KCT-300
.	KCT-300	P		10mol%
	100MPa	600	30	
가	TL	가	KCT-300	가
	TL			
	Teledyne	CaSO <sub>4</sub> :Dy	Teflon	6

가

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