

Lab report: D08 – Radiation of heated solids

Date : \_\_\_\_\_ Course: \_\_\_\_\_

Participants :

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Name	E-Mail
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Name	E-Mail

Supervisor: \_\_\_\_\_ Comment: \_\_\_\_\_ Date: \_\_\_\_\_

**1. Acquire measurement values**

U (V)	$t_s$ (°C)	Average $t_s$ (°C)	$U_{th}$ (V)
U <sub>1</sub> :	1:	MW:	
	2:		
	3:		
U <sub>2</sub> :	1:	MW:	
	2:		
	3:		
U <sub>3</sub> :	1:	MW:	
	2:		
	3:		
U <sub>4</sub> :	1:	MW:	
	2:		
	3:		
U <sub>5</sub> :	1:	MW:	
	2:		
	3:		

Measurement values part 1 - ascending

U (V)	$t_s$ (°C)	Average $t_s$ (°C)	$U_{th}$ (V)
U <sub>6</sub> :	1:	MW:	
	2:		
	3:		
U <sub>7</sub> :	1:	MW:	
	2:		
	3:		
U <sub>8</sub> :	1:	MW:	
	2:		
	3:		
U <sub>9</sub> :	1:	MW:	
	2:		
	3:		

Measurement values part 1 - ascending

U (V)	$t_s$ (°C)	Average $t_s$ (°C)	$U_{th}$ (V)
U <sub>9</sub> :	1:	MW:	
	2:		
	3:		
U <sub>8</sub> :	1:	MW:	
	2:		
	3:		
U <sub>7</sub> :	1:	MW:	
	2:		
	3:		
U <sub>6</sub> :	1:	MW:	
	2:		
	3:		
U <sub>5</sub> :	1:	MW:	
	2:		
	3:		

Measurement values part 2 - descending

U (V)	t <sub>s</sub> (°C)	Average t <sub>s</sub> (°C)	U <sub>th</sub> (V)
U <sub>4</sub> :	1: 2: 3:	MW:	
U <sub>3</sub> :	1: 2: 3:	MW:	
U <sub>2</sub> :	1: 2: 3:	MW:	
U <sub>1</sub> :	1: 2: 3:	MW:	

Measurement values part 2 - descending

## 2. Evaluation

Calculation of the radiation flux using:  $U_{th} = 0.16 \frac{mV}{mW} \phi$ .

Calculation of the true temperature using:  $T = k(T_s)T_s$        $T_s = t_s + 273 K$

Values of  $k(T_s)$  are given in the D08 script.

Put the calculated values into the following tables:

U (V)	T <sub>s</sub> (K)	T (K)	Φ (W)
U <sub>1</sub>			
U <sub>2</sub>			
U <sub>3</sub>			
U <sub>4</sub>			
U <sub>5</sub>			
U <sub>6</sub>			

U (V)	T <sub>s</sub> (K)	T (K)	Φ (W)
U <sub>7</sub>			
U <sub>8</sub>			
U <sub>9</sub>			

Measurement values part 1 - ascending

U (V)	T <sub>s</sub> (K)	T (K)	Φ (W)
U <sub>9</sub>			
U <sub>8</sub>			
U <sub>7</sub>			
U <sub>6</sub>			
U <sub>5</sub>			
U <sub>4</sub>			
U <sub>3</sub>			
U <sub>2</sub>			
U <sub>1</sub>			

Measurement values part 2 - descending

Plot the radiation flux as a function of  $T^4$  on graph paper and plot a regression line through the data points.

Discuss your results and estimate possible error sources:

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