

## Physics 10 L (Final) Tuesday Night, Fall 2003

On the table, an experiment was set-up to demonstrate. Please answer the following questions based upon the set-up on the table.

<I>. What is the title of the experiment?

<II>. What is the objective of such experiment?

<III>. What are the important equipments in this experiment?

<IV>. Please do the calculations and complete the following data table.

**Mercury Lamp**

Color	n (order)	d	a	c	sin $\theta$	$\lambda$ Measured	$\lambda$ Standard	% Error
Yellow	1	1.6933 $\mu$	94mm	270mm			0.5780 $\mu$	
	1	1.6933 $\mu$	97mm	275mm			0.5780 $\mu$	
	2	1.6933 $\mu$	210mm	310mm			0.5780 $\mu$	
Green	1	1.6933 $\mu$	89mm	270mm			0.5461 $\mu$	
	2	1.6933 $\mu$	248mm	385mm			0.5461 $\mu$	
	2	1.6933 $\mu$	210mm	325mm			0.5461 $\mu$	
Blue	1	1.6933 $\mu$	71mm	270mm			0.4358 $\mu$	
	2	1.6933 $\mu$	164mm	310mm			0.4358 $\mu$	
	2	1.6933 $\mu$	155mm	300mm			0.4358 $\mu$	

## Formula used in Calculations

$$V = f\lambda \quad (\lambda)_{\text{measured}} = 2(l_2 - l_1) \quad (V) = f\lambda_{\text{measured}}$$

$$\frac{1}{D_o} + \frac{1}{D_I} = \frac{1}{f} \quad \frac{1}{D_I} = \frac{1}{f} - \frac{1}{D_o} \quad (D_I)_{\text{cal}} = \frac{fD_o}{D_o - f}$$

$$(mag_{\text{cal}}) = \frac{D_I}{D_o} \quad (mag_{\text{measured}}) = \frac{2y}{2y_o}$$

$$n\lambda_{\text{measured}} = d \sin \theta \quad \lambda_{\text{measured}} = \frac{1}{n} d \sin \theta \quad \sin \theta = \frac{a}{c} \quad \lambda_{\text{measured}} = \frac{1}{n} d \left( \frac{a}{c} \right)$$

$$(C_2)_{\text{measured}} = \frac{m_1(T_F - T_1)}{m_2(T_2 - T_f)}$$

$$T_k = 273.15 + t_c \quad (V_2)_{\text{cal}} = \frac{V_1}{T_1}(T_2)$$

$$(V_2)_{\text{measured}} = V_1 - \Delta V$$

$$K = \frac{(\text{LENGTH CHANGE})}{(\text{ORIGINAL LENGTH})(\text{TEMPERATURE CHANGE})}$$

$$\text{LENGTH CHANGE} = \left( \frac{\# \text{ degree of angle moved}}{360^\circ} \right) \times (\pi)(\text{diameter of pointer rod})$$