L3.3 Quiz

Answers

1) What is the definition of the thermoreflectance coefficient $C_{th}$? ($R$ is the reflection coefficient, $\Delta R$ is the variation of $R$, $T$ is the absolute temperature of the surface, and $\Delta T$ is the temperature variation.)

a. $C_{th} = \frac{\Delta R}{\Delta T}$

b. $C_{th} = \frac{1}{R} \frac{\Delta R}{\Delta T}$

c. $C_{th} = \frac{\Delta R}{R}$

d. $C_{th} = \frac{1}{T} \frac{\Delta T}{\Delta R}$

e. $C_{th} = \frac{1}{T} \frac{\Delta R}{\Delta T}$

2) In a thermoelectric device, how one can separate Peltier heating from Joule heating in thermoreflectance images?

a. Peltier heating is stronger than Joule heating.

b. Joule heating is stronger than Peltier heating.

c. **Peltier signal appears at the same frequency as the excitation current while Joule signal is at twice the frequency.**

d. Joule signal appears at the same frequency as the excitation current while Peltier signal is at twice the frequency.

e. It is not possible to separate the two signals.

3) How can a transient thermal response be measured using thermoreflectance imaging technique?

a. By precisely varying the delay between the CCD exposure time and the sample excitation turn-on time

b. By precisely varying the delay between the illumination time and the CCD exposure time

c. **By precisely varying the delay between the sample excitation turn-on time and the LED illumination time.**

d. By precisely varying the delay between the sample excitation turn-on and turn-off times

e. None of the above

4) In Raman spectroscopy, temperature can be measured by

a. Measuring the intensity of Stoke signal

b. Measuring the intensity of anti-Stoke signal

c. Measuring the ratio between the Stoke and anti-Stoke wavelength shifts

d. **Measuring the ratio between the Stoke and anti-Stoke intensities**

e. Measuring the ratio between the intensities of emitted light and illuminated light