Checking Where Light Energy Goes in Two Films

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A display tests two films under the same pulse of light. Each receives 100 model energy units. In this model, all of the incoming energy is transmitted, reflected, or absorbed by the film. Nothing is scattered beyond the instruments.

Film	Transmitted energy (units)	Reflected energy (units)
P	50	40
Q	50	15

1 Which film absorbs more energy from the pulse?

(1) P only

(2) Q only

(3) Both absorb the same amount

(4) Neither absorbs any energy

2 By how many energy units do the amounts absorbed differ? Show how you use both instruments. [1]

Answer and work

3 A student says identical transmission means the films absorb identical amounts. Use the records to evaluate the claim. [1]

Answer and work

The class changes the color of the pulse. It again delivers 100 units. The transmission readings stay the same, but P now reflects 20 units and Q reflects 30.

4 Use the new records to explain whether the ranking by absorbed energy changes. [1]

Answer and work

After the new pulse, the thermal energy of each film has increased by 15 units. In this model the rest of the energy absorbed during the pulse leaves each film as light after the pulse ends. There are no other energy transfers.

5 Calculate which film emits more light energy after the new pulse. Show how the heating and optical measurements enter the calculation. [1]

Answer and work