MRSEC

Interdisciplinary Education Group

Liquid Crystal Temperature Sensors

Two properties of liquid crystals make them ideal sensors. The first is their sensitivity to changes in their surroundings. The second is their visual effects; they change color when they sense a change. Because of these properties, we can use liquid crystal sensors to "see" what our eyes can't!

Directions:

1. Place your hand on the tabletop to give some warmth from your fingers and palm to the table. Keep your hand still while doing this. Remove your hand.

Look closely. Can you see a handprint on the table with your eyes?

Place a liquid crystal sensor on top of your invisible handprint. Can you see your handprint now? Test each of the liquid crystal sensors and record your observations below.

Liquid Crystal Thermal Sheet	What do you observe?
A	
B	
C	
D	

2. Take turns holding and touching different objects (e.g., coins, refrigerator magnets) without showing each another. Use the liquid crystal sensors to "see" which object was being held. Record your observations and consider the following questions: Do some objects work better than others? Why? Do some sensors work better than others? Can you sense cold as well as heat with any of the sensors?

3. Just as some liquid crystal sensors can measure temperature, others can sense movement and pressure, chemicals (e.g., pollution, poisons), biological agents (e.g., viruses, bacteria), and electricity.

   With your group, brainstorm some potential inventions that would use liquid crystal sensors. Write your ideas below. For example, it might be good to have road signs that say "Watch out for ice" when the temperature drops below freezing and plates that say "Clean me" when bacteria or dirt are present.

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