

Concept Question 5-9: The voltage across a capacitor cannot change instantaneously. Can the current change instantaneously, and why?

$$i = \frac{dq}{dt} = C \frac{dv}{dt},$$

If voltage changes in zero time (instantaneously), the current becomes infinite, which it cannot. Hence voltage cannot change instantaneously. But the converse is not true: that is, the current **can** change instantaneously without violating any laws.