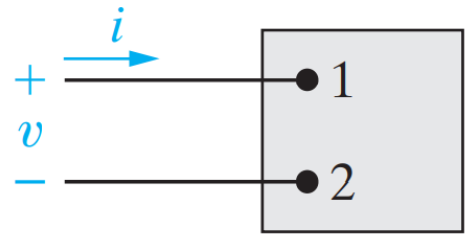




No charge exists at the upper terminal of the element in Fig. 1.5 for $t < 0$. At $t = 0$, a 5 A current begins to flow into the upper terminal.

- Derive the expression for the charge accumulating at the upper terminal of the element for $t > 0$.
- If the current is stopped after 10 seconds, how much charge has accumulated at the upper terminal?



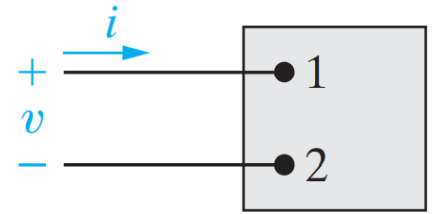
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1.7 There is no charge at the upper terminal of the element in Fig. 1.5 for $t < 0$. At $t = 0$ a current of $125e^{-2500t}$ mA enters the upper terminal.

- Derive the expression for the charge that accumulates at the upper terminal for $t > 0$.
- Find the total charge that accumulates at the upper terminal.
- If the current is stopped at $t = 0.5$ ms, how much charge has accumulated at the upper terminal?

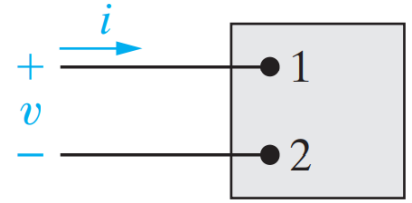
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1.8 The current entering the upper terminal of Fig. 1.5 is

$$i = 20 \cos 5000t \text{ A.}$$

Assume the charge at the upper terminal is zero at the instant the current is passing through its maximum value. Find the expression for $q(t)$.



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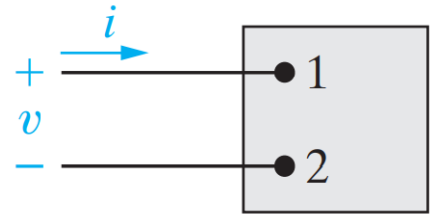


1.9 The current at the terminals of the element in Fig. 1.5 is

$$i = 0, \quad t < 0;$$

$$i = 40te^{-500t} \text{ A}, \quad t \geq 0.$$

- Find the expression for the charge accumulating at the upper terminal.
- Find the charge that has accumulated at $t = 1 \text{ ms}$.



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