Why do capacitors have equal charges

Why do all capacitors have the same electrical charge?
Then, Capacitors in Series all have the same current flowing through them as iT = i1 = i2 = i3 etc. Therefore each capacitor will store the same amount of electrical charge, Q on its plates regardless of its capacitance. This is because the charge stored by a plate of any one capacitor must have come from the plate of its adjacent capacitor.

Do capacitor plates have equal and opposite charges?
When capacitors are used in circuits,the assumption is often made that the plates of the capacitors have equal and opposite charges. I was wondering why this is the case. I have done some research. One source,The Feynman Lectures on Physics (Vol. 2) explains (Ch. 22): "We assume that the plates and the wires are perfect conductors.

How do capacitors carry electrons?
Electrons are carried from one plate of each capacitor to the other,which means that the charge stored by a plate of any of the capacitors must have come from the adjacent capacitor's plate. This means that charge carriers (electrons) have simply shifted through all the capacitors,which is the reason that the charges at each capacitor are equal.

What happens when a battery is connected to a series of capacitors?
When the battery is first connected to the series of capacitors,it produces charge -qon the bottom plate of capacitor 3. That charge then repels negative charge from the top plate of capacitor 3 (leaving it with charge +q). The repelled negative charge moves to the bottom plate of capacitor 2 (giving it charge -q).

Does electric charge flow between the plates of a capacitor?
It's true that (ideally) no electric charge flowsbetween the plates of a capacitor. Often,when doing circuit analysis,any current that enters one of the capacitor's plates is assumed to exit the other plate. We can assume this because when we inject an electron on one plate,the field it produces will repel other free charges around it.

Do capacitor plates have a total charge?
As the capacitor plates have equal amounts of charge of the opposite sign,the total charge is actually zero. However,because the charges are separated they have energy and can do work when they are brought together. One farad is a very large value of capacitance.

$begingroup$ The total energy stored in an electric field goes roughly like the volume where the field is strong. A capacitor whose plates have equal charge has a strong field in the gap between the plates, but a capacitor whose plates have unequal charge has a "fringe field" which is non-negligible outside of the capacitor.

Why do capacitors have equal charges

In series capacitors, the total charge is equal to the individual charges, while in parallel capacitors, the total charge is the sum of the individual charges. This is due to the fact that charge does not cross the capacitors and therefore must be conserved.

Why is the charge of capacitors in series the same? For series capacitors same quantity of electrons will flow through each capacitor because the charge on each plate is coming from the adjacent plate.

Most textbooks say that a capacitor whether it be a single one or one in series/parallel should have equal amounts of + and - charges on both plates and that they mostly conclude the + charges attract the same amount of ...

Series capacitor connections are trickier. In principle if the capacitors are of equal size, then they will charge equally, because when connected in series the charging current is the same.. dV/dt = I/C so if the I is the same, and C is the same, then each ...

In my textbook, for series combination it is written that the capacitors must have equal and opposite charges on both plates because if they wouldn"t then there will be an ...

In the first, short time interval, roughly equal quantities of charge will accumulate on the capacitor plates. However, due to its greater area, capacitor 2 will have a ...

In order to explain why the charges at every capacitor are mutually equal, and equal to the total amount of charge stored in the complete series connection block, let us assume that all capacitors were uncharged at one point in time.

This doesn"t make sense to me, since this would imply the capacitors have different charges. They do have different charges. Because they have different capacitances. Q = CV. V ends up the same for both after some ...

The word "capacitance" means the ratio between the charge and the voltage. If we have two capacitors, and both of them have a charge of $1 mathrm{mu C}$, but one of them has a voltage of $10 mathrm{V}$ and the other one has a voltage of $1 mathrm{V}$, then the first one is defined as having a capacitance of $0.1 mathrm{mu F}$ and the ...

Other answers have correctly explained that the charges don"t have to be equal. This is either because of the constant term (i.e. if the capacitors aren"t initially uncharged), or ...

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The potential was raised by charges amounting to +Q that accumulated on plate "1". Since the entire circuit must have zero net charge, these charges must have come from the conducting piece "4" to "B" whose ...

The bulk material of plates 2 and 3 is being suffused by an electric field from plates 1 and 4, which acts on charges in plates 2 and 3 (and the connecting wire). The effect is to pull negative charges to the surface of plate ...

We can explain how the capacitors end up with identical charge by following a chain reaction of events, in which the charging of each capacitor causes the charging of the next ...

Discover why capacitors don''t have a simple resistance value and how capacitive reactance influences AC circuit behavior. ... The voltage across both the resistor and ...

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