Verification of electromagnetic essential connection

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Abstract

Magnetic field and electric field are two independent states, known by the law of electromagnetic induction, changes in magnetic flux can generate induced electromotive force. electric wires of all materials can generate magnetic fields, we think that the magnetic field is not a characteristic, but the commonality of all elements, In order to explore the inner connection between the two transformations, we made a series of theoretical assumptions and experimental verification, the first time observed the magnetization phenomenon of copper, prove that magnetization is a process of uneven distribution of charges, the magnetic field is a specific frequency range. It has important reference value for the basic research of electromagnetic waves, guide a research of magnetic materials.

1 Introduction

We discovered through experimental phenomena, when a conductor moves from space to the N pole of the magnetic field, the conductor itself has a slight positive potential difference change relative to the outside world, then the conductor moves out of the magnetic field, there will be an opposite negative potential difference change, it means the conductor is in a magnetic field, the potential difference persists; The conductor moves to the S pole of the magnetic field, change in potential difference is the opposite of moving to the N pole, this potential difference has nothing to do with the conductor material, positive correlation with magnetic field strength, positive correlation with the speed of moving to the magnetic field.

2 Experiments And Data

The first experiment we did is shown in Figure S1,

Each end of the voltmeter connect an iron block , the iron block on the left is connected to the red wire of the voltmeter, facing the N pole of electromagnet, the other is connected to the black wire of the voltmeter, connect the electromagnet circuit, the voltmeter will return to zero after a 1.7mv change, disconnect the electromagnet circuit, the voltmeter returns to zero after a -2.3mv change, then use materials Fe, Cu, Al, SUS304 5 times each, the experimental data is shown in Table S1.

	Fe		Cu		Al		SUS304	
1	1.7	-2.3	1.4	-1.5	1.2	-1.2	1.0	-0.9
2	1.0	-0.9	1.3	-1.5	0.9	-1.9	1.5	-1.6
3	3.4	-2.0	1.5	-0.6	1.2	-0.8	0.8	-0.4
4	2.6	-3.5	1.6	-0.7	2.3	-0.5	2.2	-0.4
5	1.9	-1.2	2.3	-0.5	1.9	-0.5	2.7	-0.7

Table S1

The second experiment is shown in Figure S2, optimize based on experiment one.

Indirect switch electromagnet circuit—the ammeter shows $-0.2\mu\text{A}$ when the switch is off, then use the materials Cu, Al, SuS304 to do the same experiment, the minimum current $-0.1\mu\text{A}$, maximum $-0.5\mu\text{A}$.

Analyze the phenomenon of Experiment 1 and Experiment 2, can be determined under the external magnetic field, some electrons do directional movement, from the iron block facing the S pole to the iron block facing the N pole, if the two iron blocks in experiment two are combined into a whole, it will form a distribution similar to the PN junction as shown in Figure S3, A large number of negative charges are accumulated on the end of the conductor facing the N pole of the magnetic field and a large amount of positive charge is accumulated at the end facing the S pole of the magnetic field. At this time, the potential difference generated by the uneven electrons inside the conductor and the external magnetic field force cancel each other out, do not display electrical properties to the outside, when the external magnetic field changes, the magnetic field force breaks the balance with the potential difference inside the conductor, the directional movement of the gathered electrons forms current, this is the reason for the induced electromotive force caused by the change of magnetic flux.

According to the above conclusion, the magnetic field can cause the electrons inside the conductor to move, combined with the presence of the additional magnetic field. Here we propose the first hypothesis, magnetic field is related to positive and negative charges, magnetization is the process of uneven distribution of positive and negative charges, can be obtained from Figure S3, the magnet has more negative charges on the S pole and more positive charges on the N pole, the essence of magnetism is the gravitational action of positive and negative charges.

The third verification experiment is shown in Figure S4, artificially make a special magnet. On the basis of the above experiment two, use electromagnet to make an independent positive and negative charge generator, make Cu element magnetized and force action with magnet.

Wire the circuit as shown, yellow is copper block and copper wire, the copper block on the left is facing a electromagnet and lead a very thin copper wire, on the right is a neodymium magnet, the frequency of upper and contact of the lower single-pole double-throw switch is 0.2s.

Video S1 display, moving the magnet , In a certain position, the end of the copper wire moves closer to the magnet, explain that a force acts on the end of the copper wire, copper wire is not connected to the circuit in the experiment, eliminate the cause of attraction due to current, It can be considered that the copper wire is magnetized, replace the magnet

with iron block or copper block, has no attraction phenomenon, magnets cannot interact with Cu elements, Add a changing magnetic field to the copper wire, the phenomenon of attraction occurs. Combined with Figure 3 above, copper wire and copper block form a PN junction distributed, prove that the essence of magnetization is related to the attraction of positive and negative charges.

The fourth experiment is shown in Figure S5, On the basis of the third experiment, further strengthen, make the Cu elements can interact with each other, the copper wire and copper block attract each other.

Follow the circuit wiring as shown, combined with the conclusion of experiment two, the left and right copper blocks are equivalent to two independent PN junctions, the copper block facing the N pole absorbs energy, electrons on the copper wire are attracted and positively charged, the copper block on the right is opposite to the electron movement on the left, the edge near the copper wire is negatively charged, when the distance is close enough, the two will exert force.

Video S2 display, moving the magnet, In a certain position, the end of the copper wire is obviously shaking, contrast experiment three and experiment four, the combination of the electromagnet on the right and the copper block is equivalent to a magnet, can magnetize copper wire, the difference is that the former gives the copper wire a continuous effect—the latter is an indirect effect—prove that the inside of the magnet is a similar distribution of PN junction and it's dynamic, magnetic field force is indirect force, the magnetic field is a discontinuous field.

Experiment 2 above, the current movement is very small, the number of positive and negative charges formed is small and the force is not obvious, the softness of copper wire in Experiment 3 and Experiment 4, small size produce the same positive and negative charge density, In the natural state, there are obvious experimental phenomena under weak force.

The generation of positive and negative charges inside the copper wire is completely determined by the single-pole double-throw switching frequency, the internal charge generation frequency of the copper block on the right of experiment 4 is synchronized with the copper wire, the phenomenon is that the contact sound of the relay matches the frequency of the copper wire shaking, experiment 3 the external magnet frequency exists independently—the phenomenon is to attract copper wire—make the second assumption, magnetic materials are related to the frequency of positive and negative charges.

The fifth experiment is shown in Figure S6, on the basis of the fourth experiment, replace the copper block on the right with an iron block.

Video S3 display, moving the magnet, in a certain position, the end of the copper wire is obviously shaking, based on force interaction, it can be considered that copper wires attract iron blocks, experiment 3 the Iron alone has no electron gains and losses, experiment 5 Increase an electromagnet with the same frequency , has gravitational phenomenon, live wires of different materials can attract each other, explain that element is not a necessary condition for magnetization, We speculate that magnetic field is a common condition of matter, It is a specific frequency range where charge generated, corresponding to special elements.

Experiment 4 shows that the inside of the magnet is a dynamic process, propose the third hypothesis, In the natural state, if there are positive and negative charges with the same frequency, the magnet and the magnetic material have a same elements, defined as the main element, the element that gains and loses electrons in a magnet and generates positive and negative charges.

3 Discuss

Metal element energized wire can generate magnetic fields, explain that magnetization is not a feature, but the commonality of all elements.

$$I=U/R$$

$$I = nesV$$

n, e, s, R are all fixed values, that means U is sure, the rate of electron movement is determination, we take an atom A inside the conductor as the research object, if the surrounding electrons are not in orbit, then under the action of the electric field at both ends, electron velocity will continue to increase, inconsistent with reality excluded; another situation, the electrons move in a circle around the nucleus, Under the action of electric field at both ends, the electron breaks free from the nucleus, transition to the next atomic orbit in the positive direction, at this time, we still use atom A as the research object, to free the surrounding electrons from the nucleus, must absorb energy, the previous formula mentioned that the electron velocity in the conductor is the same, According to the law of conservation of energy, the energy absorbed by the atom is released to the outside in the form of a magnetic ring, specifically, formed an N magnetic ring as shown in Figure 7-1, the N side of the N magnetic ring is outside and the S side is inside, On the contrary, if atom A gets electrons, will absorb surrounding energy, form an S magnetic ring as shown in Figure 7-2, each atom generates a magnetic ring, the same frequency, the same direction, superimpose each other to form a magnetic field.

Magnet and PN junction have many things in common, soft iron material is equivalent to intrinsic semiconductor, easy to magnetize, PN junction mixed with B elements and P elements, Increase the number of electrons and holes, iron elements doped other materials ,

under the action of external magnetic field, form new metal bond, after the external magnetic field is removed, some electrons are left, take the side close to the N pole of the magnetic field as the research object, A part of the atom attracts electrons and merges into the orbit, some atoms do not attract electrons, the electron jumps between two parts of the atom to generate magnetic field, neodymium magnet with the largest energy product known, Its elements are B, Fe, Nd, very similar to PN junction elements B, Si, P, can be used as a direction to study strong magnets.

When the conductor is in a magnetic field, internal electronic directional movement, form a similar PN junction distribution, suppose there is a principal element in the conductor, The main element atom A inside the magnet gains and loses the electrons to produce a magnetic ring. The main element atom B inside the conductor near the N pole of the magnetic field absorbs the energy of the magnetic ring attract electrons into the orbit, In the gap between the magnetic ring and the magnetic ring, atom B just loses electron because of the loss of magnetic field force. The whole process, atom A inside the N pole of the magnet loses electrons to generate an N magnetic ring and a positive charge, atom B inside the conductor absorbs the energy of the N magnetic ring, attract electrons to merge into the orbital, creating a negative charge—positive and negative charges attract, According to reality, the main elements we can currently get are Fe, Co, and Ni.

The atoms inside a natural magnet gain and lose electrons at different times, poor magnetic ring coherence, the magnetic field formed by the overlap is a continuous magnetic torus face, the iron powder far away from the magnet is repelled by the same pole charge, like hedgehog.

The energized wire is subjected to the electric field force at both ends, atom B near the positive electrode loses electrons first, form a positive charge, electron in the outer layer of the adjacent atom C transitions to the orbital layer where the atom B loses electron, electrons in the outer layer of atom D transition to the orbital layer where atom C loses electrons, and so on. For atom B, atom C and atom D, all are lost electrons, the magnetic field formed has no distinction between N pole and S pole, Good magnetic ring coherence, surrounding iron powder is concentric circles, corresponding to the discontinuity of the magnetic field.

All the above experiments, must be in a sudden magnetic field, there are obvious experimental phenomena, replace the electromagnet with a strong magnet and move quickly, according to the inference, only magnetic materials have a change in potential difference. Both energized wires and magnets can generate magnetic fields, the magnetic field of the magnet is a specific frequency range, corresponding to special elements, contained in the magnetic field generated by the energized wire—In the experiment, all

copper wires are parallel to the magnetic pole direction of the electromagnet, eliminate magnetic domain theory interference.

4 Conclusion

The magnetic field is a microscopic field, superimposed by countless magnetic rings, N magnetic ring carries positive energy, S magnetic ring carries negative energy, essence of magnetic field force is the attraction of positive and negative charges, Non-continuous force, the magnetic ring produced by the main element inside the magnet, only the same element inside the magnetic material, electron absorption in the same orbital layer, the amount of energy absorbed determines the size of the induced magnetic field, electromagnet can magnetize all elements, natural magnets can only magnetize Fe, Co, Ni elements.

Diode in series between two copper blocks in experiment 2, both positive and reverse current meters have readings, explain that the electron directional movement is not affected by the internal voltage of the diode, so we speculate that the magnetic field and electric field act on different objects, magnetic field is generated by atoms losing or gaining electrons, may act on the gravitational force between the nucleus and the electron, conductor is not a necessary condition for magnetic material.

There are three conditions for magnetic materials to be magnetized:

First, there must be an element as the main element inside the magnetized material,

Second, at least four main element atoms in the magnetized material are required,

Third, the electrons moving around the nucleus of the main element in the magnetized material can undergo transitions.

Figures

Figure 1

The first experiment

Figure 2

The second experiment

Figure 3

A large number of negative charges are accumulated on the end of the conductor facing the N pole of the magnetic field and a large amount of positive charge is accumulated at the end facing the S pole of the magnetic field

Figure 4

The third verification experiment

Figure 5

The fourth experiment

Figure 6

The fifth experiment

Figure 7-1

Figure 7

According to the law of conservation of energy, the energy absorbed by the atom is released to the outside in the form of a magnetic ring, specifically, formed an N magnetic ring as shown in Figure 7-1, the N side of the N magnetic ring is outside and the S side is inside, On the contrary, if atom A gets electrons, will absorb surrounding energy, form an S magnetic ring as shown in Figure 7-2, each atom generates a magnetic ring, the same frequency, the same direction, superimpose each other to form a magnetic field.

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