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Result Improvement in Implantable Material Based Electronic Circuitusing Nano Particles – A Primary Approach

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ABSTRACT:

Now a day, the research has been tuned to the designing of material based conventional electronic circuit implementation. Few authors have done the reseach to some extent. The result enhancement in current realization over a short distance using nano particles has been sucessfully completed and presented in this paper. The primary analysis shows that using conducting nano particles, conductivity of the medium could be significantly increased. The author systematically shows analysis with and without nano particles. Here, the tubes have been formed from human implatbale material so the presented work could be extended for any implatable circuit with proper clinical care.

KEYWORDS: Conducting liquid, nano particles.

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INTRODUCTION:

S.P. Kosta and his team contributed a lot in realising the electronic circuit using liquid medium. First time, the boiological memristor circuit using liquid conducting medium has been invenstigated by them. By varing the different parameters like applied volatages, probe pressure, probe polarization on response characteristics have benn deeply analysed by them[1].

The researchers claim that human body is made of different conducting parts like skin, blood, wate particles etc. The afore said particles could contribute in cureent conduction and voltage development. It this would happens, it is feasible to make comventional electronic circuits using human body parts[2,3].Using the well-known concept of human body conductivity, field effect transistor can be developed using three points (probes) of human hand palm (first two) fingers. Here, the authors have used silver coated copper rings to provide sufficient and stable pressure for all three probes on the palm finger in order to do analysis on a common configuration[4,5].Marc Simon Wegmueller has also tried to project human body as conducting medium for certain circuits and networking protocol. The human body is neutral in nature but every human being live cells are surrounded by a tissue made up of a fatty acid bilayer with proteins implanted in it [6,7].nano particles are always present in to the human so Yogesh Patil and his team has used the afore said particles as a conduction medium. For the same research the authors realized that metal can be implanted into the human body and this technique is very useful to understand the chemistry of nanoparticles[8].Few researchers claimed that human body is made of conducting particles so completely human body could be treated as transmission medium.The authors have also mentioned that low voltage sensors could be placed on the human body surface for sensing the signals. The said sensors are charged using the body energy. The authors have developed S-TDMA protocol for efficiency, traffic control and delay calculation[9].A novel human implantable neural recording system could be developed which can extract the power from live human cell and supply the same power for the biomedical neural recording system [10.]

EXPERIMENTAL SECTION:

The figure 1 shows the experimental setup to find the current at specific distance. Here, the tube has been made from implantable material. Also, in tube the liquid plasma has been filled. The analysis has been donetwice to observe the effect of nanoparicles on material conductivity. The setup has been excited by 0 to 30 volt power supply. The figure 2 shows similar setup except current would be measured at two different points. Here also analysis has been carried out in the presence and without the presence of nano particles.

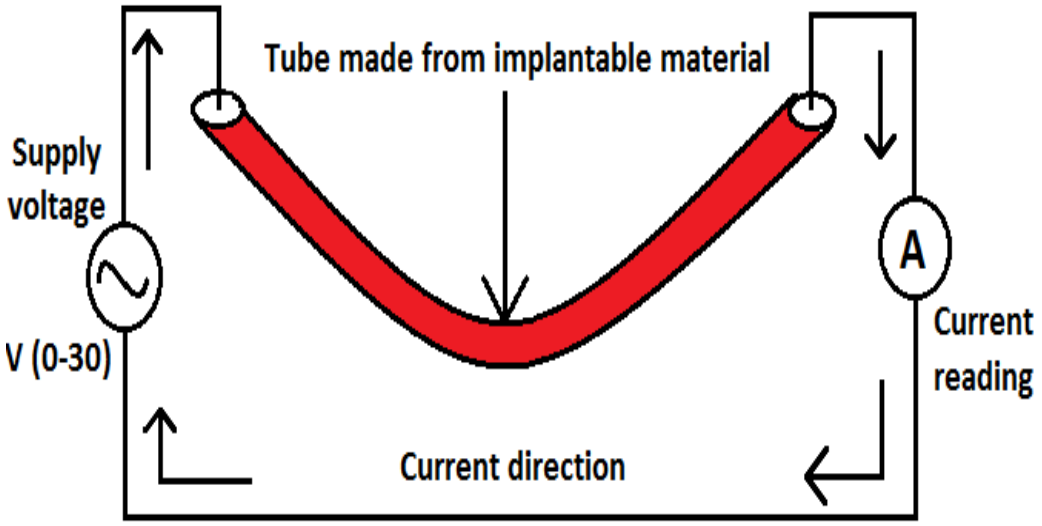

Fig. 1. Set up for V/I characteristics of liquid tubes

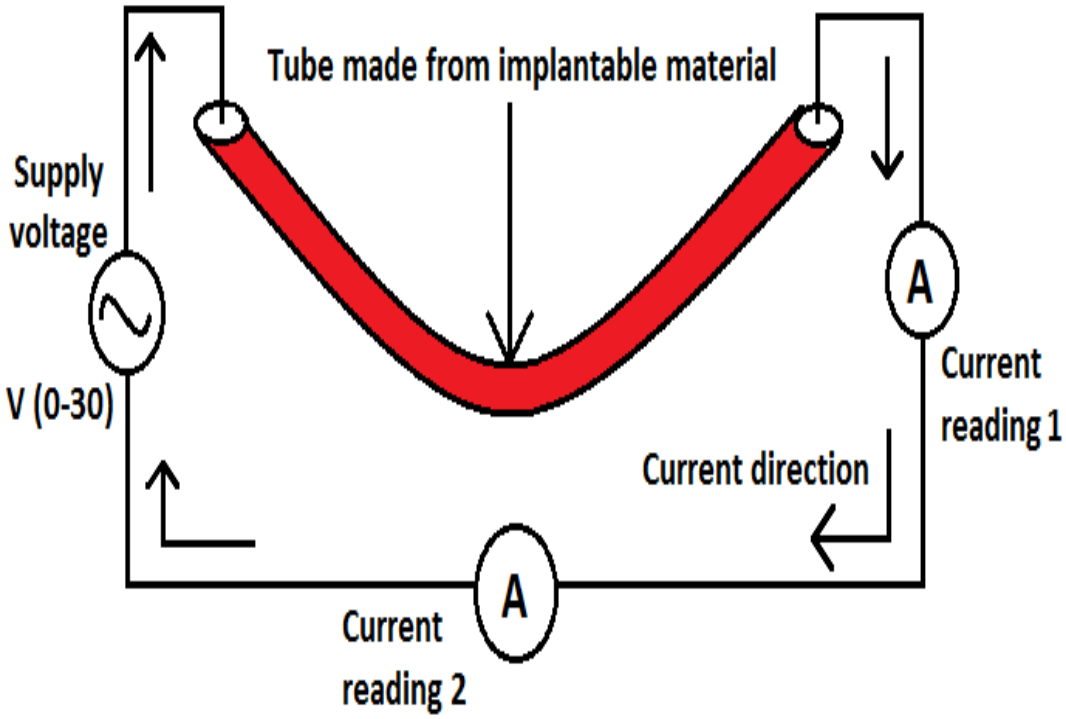

Fig. 2. Set up for two current readings against voltage variation

RESULT AND DISCUSSION:

For the both afore said experimental set up, 0 to 30 volts voltage supply has been given to the circuit.Obviously, in second case, current readings are less compared with previous case because the conductivity is inversely proportional to the distance so as the distance increases, the conductivity decreases. The experiment shows that the result would be significantly improved in the presence of nano particles. The table 1 and table 2 show the readings of both the setup respectively.

Table 1. V-I characteristics – with and aithoutnano particles

Input voltage(V)	Current(mA) (without nano particles)	Current(mA) (with nano particles)
0	0	0
1	0.017	0.025
2	0.049	0.099
3	0.077	0.102
4	0.11	0.34
5	0.14	0.39
6	0.17	0.21
7	0.2	0.45
8	0.23	0.48
9	0.29	0.52
10	0.3	0.31
11	0.34	0.70
12	0.38	0.72
13	0.41	0.57
14	0.45	0.58
15	0.49	0.60
20	0.67	0.81
25	0.84	1.02
30	1.03	1.11

Table 2.V-I characteristicsfor two current readings – with and without nano particles

Input Voltage(v)	Current reading 1(mA)		Current reading 2(mA)	
	Without nano particles	With nano particles	Without nano particles	With nano particles
0	0	0	0	0
1	0.02	0.04	0.016	0.021
2	0.05	0.07	0.039	0.040
3	0.07	0.09	0.06	0.06
4	0.11	0.32	0.094	0.099
5	0.14	0.35	0.11	0.13
6	0.17	0.38	0.14	0.16
7	0.2	0.5	0.17	0.11
8	0.23	0.52	0.2	0.21
9	0.26	0.52	0.23	0.25
10	0.3	0.49	0.26	0.29
11	0.33	0.49	0.283	0.31
12	0.36	0.50	0.311	0.35
13	0.4	0.60	0.34	0.38
14	0.43	0.63	0.37	0.41
15	0.47	0.7	0.4	0.41
20	0.63	0.71	0.542	0.67
25	0.74	0.78	0.67	0.75
30	0.91	1.0	0.607	0.9

CONCLUSION:

The current measurement according to the Ohm's low has been successfully completed and presented in the presence and absence of nano particles in this paper. The response of the circuit shows that conductivity of the liquid medium could be improved using nano particles. Here, the tubes have been formed from human implatbale material so the presented work could be extended for any implatable circuit with proper clinical care.

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