Editorial Letter | Submit Manuscript

Turkish Journal of Materials

Developments in Materials Science and Contribution to Science

M.F. Keskenler

Department of Turkish Journal of Materials, Science Literature

Published: 31/12/2016

Turk. J. Mater. Vol: 1 No: 1 page: IV-V (2016) ISSN: XXXX-YYYY

SLOI: http://www.sloi.org/sloi-name-of-this-article

Correspondence E-mail: mfkeskenler@gmail.com

ABSTRACT In materials science unfolds new discoveries and developments day by day. Studies contribute to innovation. Some of these studies examined in this text. Information has been provided on these work and opinions have been expressed on the benefits of the work.

Keywords: Science Literature; Materials; Science.

Cite this article: M.F. Keskenler. Developments in Materials Science and Contribution to Science. Turk. J. Mater. 1(1) (2016) IV-V.

Physicists have added a new member among the exotic species in the sub-atomic world. These new subatomic particles are known as tetraquarks. In Fermilab, a high-energy particle physics laboratory in the US, DZero researchers have discovered tetraquarks. This phenomenon, described as the discovery of a new particle, is thought to help researchers understand the powerful interaction (strong force), one of the four known fundamental interactions in physics. Other basic forces are gravitational force, electromagnetic force and weak interaction. The DZero scientists give a name X(5568) to this particle when they saw their first clue to this new particle in July 2015, because the mass was 5568 mega electron volts [1]. Quarks are basic particles that exist in two or three packages. The most famous of these are the proton and neutrality, each consisting of 3 quarks. But there are six types of quarks: up, down, weird, charm, bottom and top. They also each have antimatter.

On the other hand, A group of researchers from the Joint Quantum Institute in the USA and theoretical physicists from the National Institute of Standards and Technology (NIST) conducted an interesting study. According to a report in the Nanowerk, with this work, a step was taken to build objects out of the photons. Researchers who have found that photons, which are massless particles of light, can join a molecule with their own strength, showed that the two photons could be interlocked within a short distance. That is, under certain conditions, these photons can form a structure similar to two atomic molecules.

Finally, theoretical physicists have proved the process of attaching the article "Coulomb bound states of strongly interacting photons" in Physical Review Letters through several parameters [2]. According to this study, this bonding occurs when the photons can move side by side at a certain distance from each other. This process is similar when two hydrogen atoms in a hydrogen molecule are adjacent to each other. Alexey Gorshkov of theoretical physicists says, "It is not a molecule on its own, but it can be thought of as having a similar structure".

As far as the interaction engineering between photons is concerned, further advances can be gained for the technologies in these fields. For industry, bound and entangled photons can enable computers that use photons as their data processors. In fact, this can also provide significant energy savings. Because correspondence and other data exchanges move through fiber optic cables in the form of bundles of light, but they must be converted to electrons for processing. This process is an inefficient process in which a significant amount of electricity is used. Therefore, energy losses can be reduced if the photons are used again in place of transformation in the processing of the data.

Developments in the field of nanomaterials seem to change the luck of thermoelectric materials. Thermoelectric materials have become a promising technology for generating electricity from the heat that is thought to be lost. The basic logic of these thermoelectric materials is an electric current generated by the temperature difference between the two ends of the material. Therefore, it may be possible to produce electrical currents from computers, automobiles, etc. made of these materials.

According to a paper published in Applied Materials and Interfaces, researchers have found that is allowing the material to generate electric current even at room temperature, when a small amount of graphene is applied to the thermoelectric material named strontium titanthritide (STO), because STO could generate electric current at extremely high temperatures [3]. The graphene causes this big difference. Energy efficiency is very low in traditional thermoelectric materials. It is around one percent. With the addition of graphite, researchers report this yield to be between 3 and 6 percent.

These studies have great importance because about 70 percent of the fuel used for a car loses to heat and friction. If such materials are available, a significant increase in energy efficiency can be achieved by recovery of the thermal energy.

References

[1] Dmitri Denisov and Paul Grannis, DZero discovers a new particle consistent with a tetraquark. (2016).

[2] M. F. Maghrebi, M. J. Gullans, P. Bienias, S. Choi, I. Martin, O. Firstenberg, M. D. Lukin, H. P. Büchler, A. V. Gorshkov, Coulomb bound states of strongly interacting photons, Physical Review Letters. (2015).

[3] Yue Lin, Colin Norman, Deepanshu Srivastava, Feridoon Azough, Li Wang, Mark Robbins, Kevin Simpson, Robert Freer, and Ian A. Kinloch*, Thermoelectric Power Generation from Lanthanum Strontium Titanium Oxide at Room Temperature through the Addition of Graphene, ACS Applied Materials and Interfaces. 7 (2015) 15898-15908.