



PARAMETRIC STUDY AND INVESTIGATION OF BATTERY PERFORMANCE

Dipendra Kushawaha¹, Jogendra Kumar²

¹M.Tech Scholar, Department of Mechanical and Aerospace Engineering, Nims University, Jaipur, Rajasthan, India

² Asst. Professor, Department of Mechanical and Aerospace Engineering, Nims University, Jaipur, Rajasthan, India

Abstract

The battery-powered ought eco-accommodating for the climate. It tried usually accessible battery-powered to recognized charging to be quicker than fluid cell batteries. The different boundaries concentrated on these batteries are detail, battery power, charging time, constraints. From the review and information assortment, positioning of batteries is done in view of power result and charging time. The high positioned batteries were planned for future investigation of a battery joining. This paper focused on power output, charging time with using this parameter rank according to charging time, rank according to the power develop a 2H3L model battery performance parameters. The maximum power output from silver calcium battery is 14.8 v which get ranked no 1st among 6 different batteries. According to the charging time it was ranked in 4th number. The minimum power output from deep cycle battery that is 12v which get ranked 2nd among 6 different batteries. According to the charging time it was ranked in 3rd number. It gets power output from aluminum-ion battery that is 4v ranked 3rd among 6 different batteries. Power output from Lithium-ion battery is 4v get ranked 4th among 6 different batteries. According to the charging time ranked in 2nd number. Power output from lithium polymer battery that is 3.7v which get ranked 5th among 6 different batteries. According to the charging time it was ranked in 5th number. It is found less power output by lead acid battery and worst charging time that is placed in 6th ranked on both positions according to the power output and charging time. Silver calcium battery and aluminum-particle battery revels most extreme power and least charging time powerful result and low charging time. Its high energy thickness permits batteries to drive complex and it additionally re-energize rapidly to hold their charge longer.

Keywords- 2H3L Model, Power and charging time, charging time, maximum power and minimum charging time.

INTRODUCTION

An electrical device that can generate electricity and provide it when needed is called a battery. It has approximately one electrochemical cell. A battery is usually a device with an external power source and a large n

umber of electrical cells connected to its output. A battery is at least one type of battery whose reactions cause electricity to move in a circuit. Every battery has three main components: an electrolyte or similar (a substance that makes up the anode and cathode), the anode (side), and the anode ("+" side) Before, Batteries, scientists used the Leiden volume to store charge. The Leiden cell is an early form of capacitor that, unlike a battery, can simultaneously store and transmit charge. Benjamin Franklin, the founder of Slumdog America, may have considered developing a "battery" for common guns after some tried to piece together some interventions at Leyton for greater compensation. Associate and independent scientist Alessandro Volta confirmed the discovery that electrical products are created by joining two special metals to an adhesive substrate, according to a special publication by Luigi Galvani. In 1791 he tested this theory and got the result. In the 1800s, Volta created the voltaic group, the first battery recognized for controlling and transmitting electricity instead of directly charging. The electric charge consists of rings of copper and zinc, one above the other, held in place by a film or other material containing brackish water (electrolyte). Unlike the Leiden cell, the voltaic cell produces constant energy with little loss when not in use; However, its simple structure cannot transmit electricity enough to transmit light. He experimented with different metals and found that zinc and silver worked best. Volta realized that electric current is suspended from two different substances in contact with each other, rather than the structure of reactive blocks, a misconception known as contact. He decided to use zinc sheets to make minor imperfections that could later be repaired by changing the material. However, no analyst has done anything to stop the practice. In fact, it has been found that applications appear faster when the current is drawn more. This indicates that usage has an effect on the battery's ability to conduct current. This partly led Volt to reject the contact pressure hypothesis of electrochemical theory. Volta depicts the top of the bowl and a group of Voltas with additional metal circles at the top and bottom that are now known to be of no value. The picture of the Zn,Cu voltaic group shows a new concept; Specifying "contact pressure" does not indicate the location of the voltaic load's EMF. The old Volta load models have many disadvantages, one of which is electrical and short circuit due to the importance of spraying the plates onto the surface when spraying salt water. Scot William Cruickshank solved this problem by planning instead of letting go of what was needed. It's called a battery holder. Walter collected his own and made some glass vessels with salt shakers. Jump into the liquid attached to the metal stand. Its name is "The Crown of the Holy Grail". This match is made by combining two different metals, such as copper and zinc. While this model is not as popular as its category, it has proven to be more effective.

LITERATURE REVIEW

Compared to examining the performance of different types of batteries, we reviewed close to 50 articles on batteries, 20 of which are listed in detail and briefly in content. Studying many batteries, comparing and contrasting [1] Rafael B. Charomers University of Technology 02 solvent model (COSMORS) method allows selection of electrolyte solvents based on a layer of physicochemical and electrochemical properties. Recommended as a time and effort saving tool to measure Ca as a candidate electrolyte prior to clinical trials. [2] Meng Liao et al. Fudan University 2019, Extraction of gas anions from vanadium oxide as a deep water zinc ion battery exhibited stability over 200 cycles, with capacity reaching ~400 mAh·g⁻¹, reaching 95% usage. Theoretical capacity and cycle life are up to 2000 cycles, and the utilization rate is up to 67%. This work op

ens a new avenue for the synthesis of new cathode materials for advanced batteries by creating an oxygen, free structure [3]. Sefu kitaronka Siirt University Turkey In January 2022, lead,acid batteries were presented. A recent study on their economic and environmental impact has shown that leadacid batteries are not suitable for household electrical wiring. [4] Caesar a.c. sequeira1, Mario R. June 2, 2014 Pedro O 0 Lead,acid battery tank launched. This article contains some reviews of these reimbursement systems under research and development. [5] Liu Yiqun, Y. Gene Liao and Ming, Chia Lai Wayne State University January 27, 2020 Liion Polymer Batteries for 12 Volt Applications: Experiments, Modeling and Application Demonstrations, Simulation of 12 Volt Battery Packs 20 Ah And lithium-nickel-manganese cobalt oxide battery in this article, the effect of ambient temperature and charge/discharge current on battery performance, such as voltage and usable capacity. The proposed simulation model provides a design framework for lithiumion polymer batteries in electric vehicles and sustainable energy applications.

METHODOLOGY

The strategy took on is abstract and similar investigation of vehicle batteries existing on the lookout. Around 50 articles were considered and out of which 6 articles were positioned from 1 to 6 in view of their significance to this review. The different boundaries concentrated on these batteries are battery Detail, battery power, and charging time. Constraints From the review and information assortment, positioning of batteries is done in view of (a) Power result, and (b) Charging time, as these two is seen as basic boundaries. Following rankings, the high positioned batteries were planned for future investigation of a battery joining these two high positioned batteries, in this paper we mostly focused on power output, charging time with using this parameter we put out the rank according to charging time, rank according to the power and also develop a model that's name called 2H3L model Battery performance parameters, it means that 2 High and 3 Low.

Table 2 Ranking according to maximum power output and minimum charging time

S. No	Battery name	Maximum power output	Rank	Battery name	Charging time	Rank
1	Lithium ion	4 v	4	Lithium ion	2 hr.	2
2	Lithium polymer	3.7 v	5	Lithium polymer	3 hr.	5
3	Aluminium ion	4 v	3	Aluminium ion	1 min	1
4	Lead acid	2.45 v	6	Lead acid	8 hr.	6
5	Deep cycle	12 v	2	Deep cycle	2 hr.	3
6	Silver calcium	14.8 v	1	Silver calcium	4 hr.	4

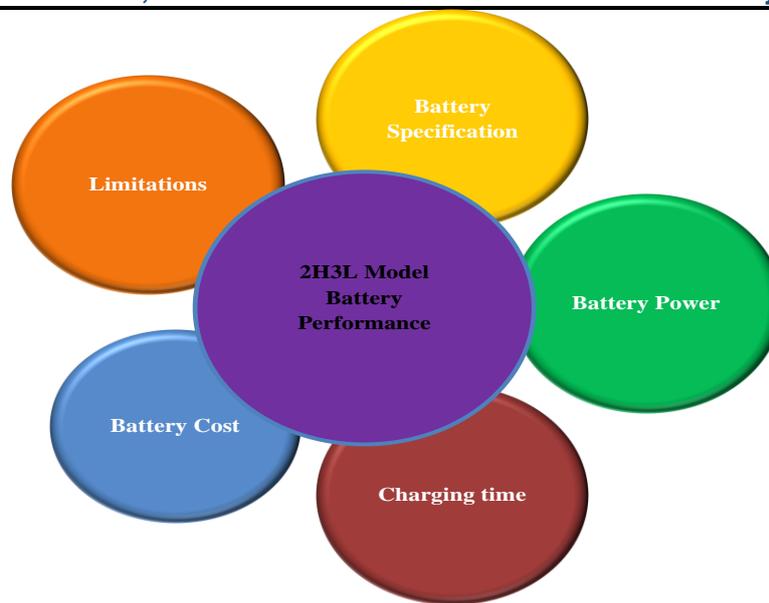


Figure 1 2H3L Model Battery Performance Parameters

FINDING AND RESULT

We get maximum power output from silver calcium battery that is 14.8 v which get ranked no 1st among 6 different batteries. According to the charging time it was ranked in 4th number. We get minimum power output from Deep cycle battery that is 12v which get ranked no 2nd among 6 different batteries. According to the charging time it was ranked in 3rd number. We get power output from Aluminum-ion battery that is 4v which get ranked no 3rd among 6 different batteries. According to the charging time it was ranked in 1 number. We get power output from Lithium-ion battery that is 4v which get ranked no 4th among 6 different batteries. According to the charging time it was ranked in 2nd number. We get power output from lithium polymer battery that is 3.7v which get ranked no 5th among 6 different batteries. According to the charging time it was ranked in 5th number. We get less power output by lead acid battery and worst charging time also that is placed in 6th ranked on both positions according to the power output and charging time.

Table 1 Power output and charging time

S. No	Battery name	Power output (v)	Battery name	Charging time
1	Lithium ion	4 v	Lithium ion	2 hr.
2	Lithium polymer	3.7 v	Lithium polymer	3 hr.
3	Aluminium ion	4 v	Aluminium ion	1 min
4	Lead acid	2.45 v	Lead acid	8 hr.
5	Deep cycle	12 v	Deep cycle	2 hr.
6	Silver calcium	14.8 v	Silver calcium	4 hr.

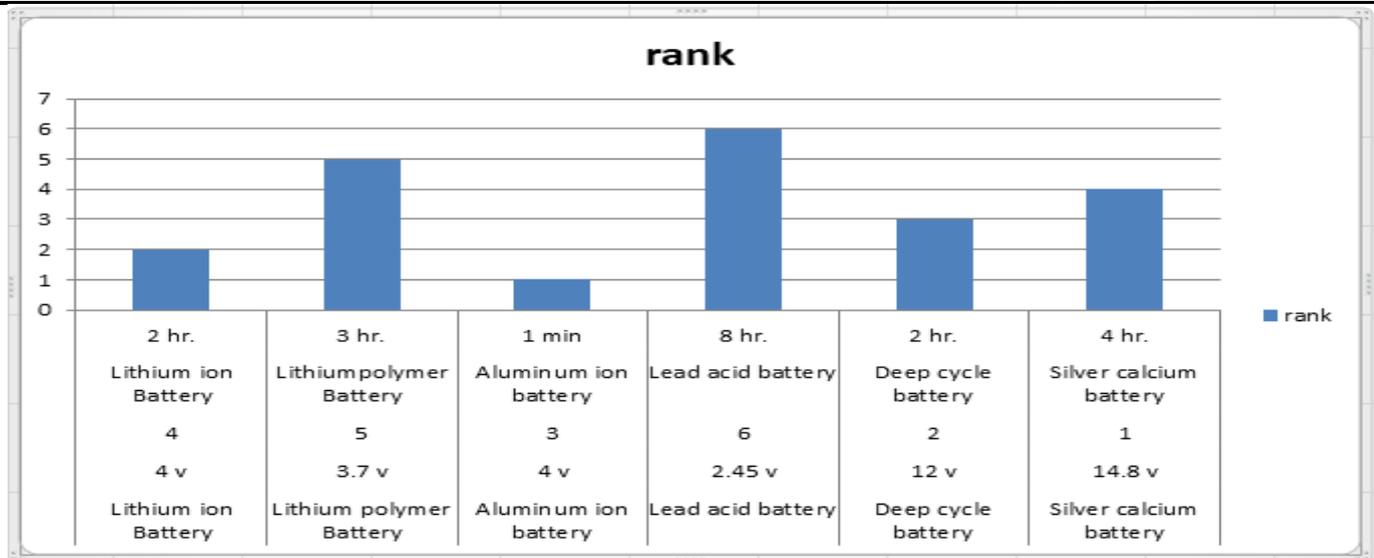


Figure 2 Rank according to minimum charging time

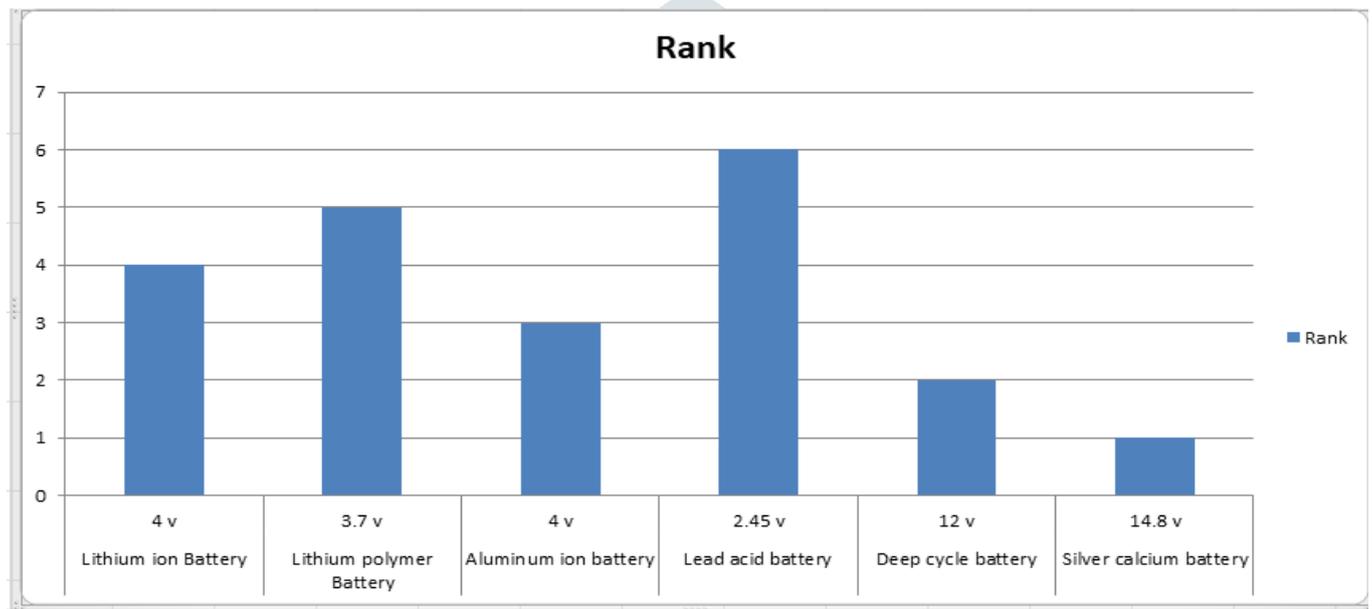


Figure 3 Rank according to maximum power output

CONCLUSION

Silver calcium battery and Aluminium-particle battery reveals most extreme power and least charging time in light of the fact that its powerful result and low charging time. its high energy thickness permits batteries them to drive complex auto and it additionally re-energize rapidly and hold their charge longer.

The battery-powered batteries ought to be most suggested on the grounds that they appear as though really smart as they are more eco-accommodating for the climate right away anyway, we have tried usually accessible battery-powered batteries we have recognized that their charging to ought to be quicker than fluid cell batteries and its presentation ought to be great And its assembling cost ought to be least and cost ought to be reasonable for everybody. The modest Batteries can be viewed yet incredible consideration to needs as taken utilizing bad quality batteries can prompt early battery disappointment and short battery duration.

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CONFLICT OF RESPONSE

Author declared to no conflict of interest.

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