Outline of Three Main Businesses of Lead-acid Batteries Using ITE's Organise Polymer Activators

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Abstract

Since 1955, ITE Research Group worked for new type of additive activators for lead-acid batteries to extend the life. The activator now becomes almost perfect. Therefore, we tried three main areas of its application: (1) addition to new batteries, (2) extension of the battery life for batteries under use, and (3) regeneration and reuse of replaced batteries. In this short communication, the financial size of the three businesses is estimated.

Keywords

organic polymer activator, lead-acid battery, low lead battery, SLI battery, life extension, large energy saving

1. INTRODUCTION

Lead-acid battery was invented in 1860 by plant and the paste type battery was developed by Faure 1881. [Linden, 1995] Many activators have been tried for mixing in the paste of negative electrode paste. They are barium sulphate ($BaSO_4$), lignine, and fine carbons. Most previous researcher has not tried acid soluble additives as activator, since soluble materials are oxidized at the positive electrode. Kozawa and his associate tried organic polymer activator with and without fine carbon [Kozawa et al., 1977], and U.S. Patent was obtained. [Kozawa et al., 1999] After trying various application of our new organic polymer activator for various lead-acid batteries, we found three types of applications. In this paper, the business size of each application and outline of the operation is described. The details of each business aspect will be described in three separate papers.

2. THREE BUSINESS FOR ITE'S ACTIVATOR

Table 1 shows three main business area of our organic polymer activator and money value of the business.

Table 1 Three main application areas

(1)	Production of low lead SLI batteries
	(a) 25-50% lead reduction is possible without reducing the service life. (b) Size of business (world wide, $20 billion per year) 25% reduction ….. Saving is $4 billion per year 50% reduction ….. Saving is $8 billion per year Calculation based on annual production of total battery of $20 billion. ($12 billion is for SLI batteries)
(2)	Life extension of batteries under use now
	(a) We can extend the life at least 2 year for $80 billion worth batteries (assuming average life is 4 years). (b) Size of business (or saving in $), about $40 billion
(3)	Regeneration and reuse
	(a) About 50% of the abandoned (replaced) batteries are recovered and will be reused for 2 to 3 years. (b) Size of business (50% of new battery production), $10 billion

2.1 New low lead battery production

Since the price of new lead metal increased from $500 per ton in the year 2004 to $3,500 in 2007, reduction of lead use for new batteries is very important. Without organic activator, the new battery become shorter in life, if the number of the electrode is reduced by 25 to 35% with our activator (powder added to dry charge battery). The battery price is 10 to 20% cheaper, since the activator is inexpensive. These electrode reductions are possible only for SLI batteries. The deep cycle batteries such as golf cart batteries, forklift batteries, and EV batteries must has enough electrode materials. We can not reduce the number of electrode plate or electrodes size and amount of paste (plate thickness). Because these batteries need Ah capacity for these deep cycle batteries, the benefit of our activator is extension of the life. We can extend the life if we add activator and water properly once a year and properly charge the battery life can be extended considerable. For example, the forklift battery can be used for 15 years and the golf cart batteries can be used for 7 to 10 years, instead of 3 years. We have to use these long life batteries for lease or rental system to make money.

2.2 Life extension of batteries under use

We add activator for truck, buss, and taxi batteries once a year regardless of the use age. The partial sulfation will be removed while using under normal charging. Therefore, the battery life will be extended at least 2 to 3 years.

2.3 Regeneration of replaced abandoned batteries

Taxi or truck batteries are replaced every 2 to 3 years. Most of the replaced battery has sulfation due to insufficient charge. After addition of our activator and water, when 3 to 5 day continuous charge is given at low current (1/20C), 50-60% of these batteries will be regenerated (recovered) to the normal capacity (70 to 80% of the original capacity), and they become reusable battery. The details of the regeneration operation and the battery reaction will be reported in other separate paper.

3. CONCLUSION

Because of the large energy saving (total of $20 to 50 billion per year) for lead reduction and reuse of regenerated battery, we believes our activator will contribute to our human life in many years.

References

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