

Curing of positive plates. This is the most time consuming technological procedure (24-72 hours). During curing the following processes take place: Pb oxidation; recrystallization of 3BS, 4BS and PbO; grid corrosion; improvement of the paste/grid contact, and drying of the paste. With increase of curing temperature the rates of the curing processes will be accelerated and curing time can be shortened. At to $> 65^{\circ}\text{C}$, 3BS paste transforms into 4BS paste comprising large crystals which are difficult to oxidize to PbO_2 during formation. With the new technology for paste preparation from $4\text{BS}+\text{Pb}_3\text{O}_4$ the upper temperature limit of curing is eliminated. The processes during curing of $4\text{BS}+\text{Pb}_3\text{O}_4$ paste at 93°C with H_2O vapour purged through the curing chamber have been investigated. It has been established that curing of 4BS pastes under these conditions proceeds for less than 8 hours. Batteries manufactured with such plates have initial capacity equal to the rated one and cycle life considerably longer than that of batteries produced from 3BS pastes.

When curing is conducted at temperatures above 80°C , the 3BS particles are converted into 4BS ones which contain water. It has been established that positive plates produced with 4BS pastes cured at 50°C have the longest cycle life and adequate capacity performance. Positive plates prepared with 3BS pastes, which are then converted to 4BS ones during plate curing at 90°C , have high initial capacity and power performance but shorter cycle life. Batteries with plates produced with 4BS and then cured at 90°C for less than 4 h have both satisfactory power output and cycle life.

Curing of negative plates. For high tech battery manufacture the duration of curing of negative plates should be less than 8 hours. Additive B-88 (0.5%) to the negative paste increases the rate of the curing processes at 60°C and shortens the technological procedure of curing to 8 hours. Expanders disintegrate at temperatures higher than 65°C . The new curing mode proposed results in 10% increase in total pore volume of cured paste and 20% increase in dry paste specific surface area, and formation of a fine-grain and more uniform structure.