A Convenient High Potential Battery.

By R. R. Ramsey.

In work on radioactivity it is necessary to have a battery whose potential is 100 volts or more. If one has access to a direct current lighting circuit a storage battery made of test tubes with sheet lead strips for electrodes can be used. Fifty such cells arranged in a rack make a convenient battery when the lighting circuit is 110 volts. Such a battery requires a week or more for forming, and due to the small capacity of the cells they should be connected to the charging circuit all the time except when in actual use. When it is not convenient to make such a battery, or when the facilities for keeping it charged are not at hand, I have found that a battery can be made with little trouble and expense of tubular flash lamp batteries. The so-called 3½ volt flash lamp batteries consist of three small dry cells slipped into a pasteboard tube. The bottom of the cell is the negative terminal, while the central carbon has a projection extending through the top, which serves as the positive terminal of the cell. Thus the three cells when placed in the tube are in series. If the cells are slipped down through the tubes until the bottom ones project one-half their length the batteries can be placed one on top of another and form a long battery connected in series, the potential of which depends upon the length. The so-called 3½ volt battery when new has an E. M. F. of about 4.4 volts. Or twenty-five such batteries in series give 110 volts. Of course it is not necessary to connect all in one "stick." They can be placed in "sticks" of convenient length and placed upright in a box and connected in series by soldering wires to the ends, thus making connections which will give intermediate potentials. When new these batteries have very low resistance, and great care should be exercised to prevent short circuiting the cell. Like all dry cells the resistance increases with age and the potential at the terminals as shown by a voltmeter will decrease. But the E. M. F. of the cells as shown by potentiometer measurements remains constant until the cells are completely dried out. Since the battery in radioactivity work is

used for static potentials the high internal resistance of the cells will not cut any figure.

These batteries can be obtained from the electrical supply houses at 20 cents apiece. Thus a 110 volt battery will cost $5.00.

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