ABSTRACT

In this chapter the safety of rechargeable energy storage systems is discussed with a focus on Li-ion batteries. The main hazards, such as fire, explosion, direct electrical hazards (electrical shock and arcing), indirect electrical hazards, and chemical hazards are reviewed. Relevant failure scenarios—overheating, mechanical deformation, external short circuit, and overcharge—are presented together with the main approaches for risk mitigation. Potential safety implications of the application of nanomaterials in rechargeable energy storage systems are discussed. Finally, a comprehensive summary of the most common tests for assessing safety under thermal, electrical, and mechanical abusive conditions as described in relevant standards and regulations is given.