

**On the Electrochemical Behavior of $\text{Si}_{3-x}\text{M}_x\text{N}_4$ Compounds
[M = Co, Ni & Fe]**

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Lithium, commonly known for the high specific capacity suffers from poor cycle life and so the very first attempt of ambient temperature rechargeable lithium cells with lithium metal anodes has failed unavoidably. Similarly, the lower energy density shortcomings of carbon anodes has hampered the wide acceptance of carbon as a promising anode, despite the popularity gained through the commercialization by Sony energy tec. Also, respective and specific problems of metal oxides that need the presence/supply of extra internal lithium within the cell and the alloy crumbling and mechanical cracking difficulties of lithium-metal alloy anodes, etc.. have ultimately placed an immediate necessity to find out the existence of better alternative systems as practically viable anodes for lithium batteries. In this regard, Li_3N compound was identified as one of the possible candidates, which is also reported to suffer from severe moisture sensitivity problems. Therefore, a newer variety of ternary silicon transition metal nitrides of the general formula $\text{Si}_{3-x}\text{M}_x\text{N}_4$ has been chosen for the present study. A series of $\text{Si}_{2.6}\text{M}_{0.4}\text{N}_4$ compounds with M = Co, Ni and Fe were synthesized, characterized and evaluated for their suitability as possible anodes for use in rechargeable lithium-ion batteries. The method of synthesis and the systematic physical as well as electrochemical characterization studies carried out for the aforesaid compounds are discussed in detail.