



SDI Review Form 1.6

Journal Name:	International Research Journal of Pure and Applied Chemistry
Manuscript Number:	2014_IRJPAC_10924
Title of the Manuscript:	Synthesis, characterization and electrochemical studies on $\text{Li}_4\text{Fe}(\text{CN})_6$ as cathode material for Li-ion batteries
Type of the Article	Original Research Article

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	- Find out the difference between lithium ion battery and lithium battery. Then carefully see the title. - The manuscript is not well written. Please check the manuscript for English correction with fluent professor. - In the expt. part how can you confirm the replacement of all K by Li in $K_4Fe(CN)_6$ - Why TGA shows slight increase in weight in beginning? You are mentioning above 120 deg, there is a weight occurred and is not stable. But in the next line sintering the materials at 180 deg to get dehydrated phase. Comment on this.	- Lithium batteries are disposable (primary) batteries that have lithium metal or lithium compounds as an anode and a non-lithiated compound as cathode, whereas, lithium-ion batteries are rechargeable batteries in which the cathodes are lithium composite materials and anodes are intercalated lithium compounds, where, lithium ions move between the anode and the cathode during charge-discharge. Accordingly the given title is correct. - The manuscript has thoroughly been checked for English correction. - All K can't be replaced by Li-ions, but ~ 96% has been replaced, which is confirmed from EDX data. EDX data has been included (Table 1). - The TGA shows slight increase in weight at the beginning attributed due to the absorption of moisture or carrier gas. In TGA curve, we have recorded the percentage weight loss vs. temperature from temp. 40 °C to 860 °C. We divided the curve in different step like, 40 °C to 120 °C as first step; 120 °C to 350 °C as second step; 350 °C to 410 °C as third step and so on. We have applied heat to remove the water completely from the material but cautiously and control way, so that decomposition does not occur and particle size remain smaller. Hence, we first dried the solution at



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	5. What is the purpose of using two different carbon sources to prepare electrode material? 6. Like UV try to take the slow scan FTIR for 3 samples and explain the peaks. 7. Run the XRD for the above three samples and compare the results. Dry the samples in vacuum oven under heating with your convenience. I hope you will get XRD for $K_4Fe(CN)_6$. Find out the peaks due to the reactant. 8. under section 3.5 you mentioned 2 peaks, but given values for one peak. Comment. 9. Why there is decrease in the oxidation and reduction peaks?	70 °C under vacuum and then heated at 180 °C. TGA curve shows that the second step (120-350 °C) is almost steady and within this temperature range only crystalline water is removed. So we chose 180 °C for complete water removal. 5. Carbon black and graphite powder are used as the conductive additive to increase the electronic conductivity of the electrode, which ultimately increase the Li^+ diffusion rate throughout the cathode material. Secondly graphite acts as both conductor and lubricant. 6. Slow scan FTIR of $K_4Fe(CN)_6$, $K_4Fe(CN)_6 \cdot 3H_2O$, $Li_4Fe(CN)_6$, $K_3Fe(CN)_6$ have been included. The peaks at $2044-2071\text{ cm}^{-1}$ are the characteristic stretching frequencies of ferrocyanide group are present in $K_4Fe(CN)_6$, $K_4Fe(CN)_6 \cdot 3H_2O$ and $Li_4Fe(CN)_6$ and characteristic ferricyanide peak at 2118 cm^{-1} as shown in the figure 3 is absent in $Li_4Fe(CN)_6$. 7. Powder XRD of $K_4Fe(CN)_6$, $K_3Fe(CN)_6$ and $Li_4Fe(CN)_6$ are performed and compared the result. 8. In revised manuscript, section 3.5 changed to section 3.7. It is seen that in Cyclic voltammogram (Fig. 7), in the first cycle during forward scan two oxidation peaks appeared at 3.58 volt and 4.4 volt and the corresponding two reduction peaks are observed at 2.71 volt and 1.75 volt. 9. The multi peaks converges into a single peaks in subsequent cycles. This indicates a structural changes within the molecule during oxidation-reduction process, because only a single oxidation and
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	10. In my knowledge giving ref. in conclusion part is good. I have not found any articles on this. Clarify this.	reduction peak is expected for $\text{Li}_4\text{Fe}(\text{CN})_6$. 10. References from the conclusion part have been removed.
Minor REVISION comments	Accept with minor comments	
Optional/General comments	As they mentioned it is a new cathode material only. But it cannot compete with the existing one. Because specific discharge capacity is less compare to the existing.	