

Supplementary materials

Thermal Stability and Radiation Tolerance of Lanthanide-Doped Cerium Oxide Nanocubes

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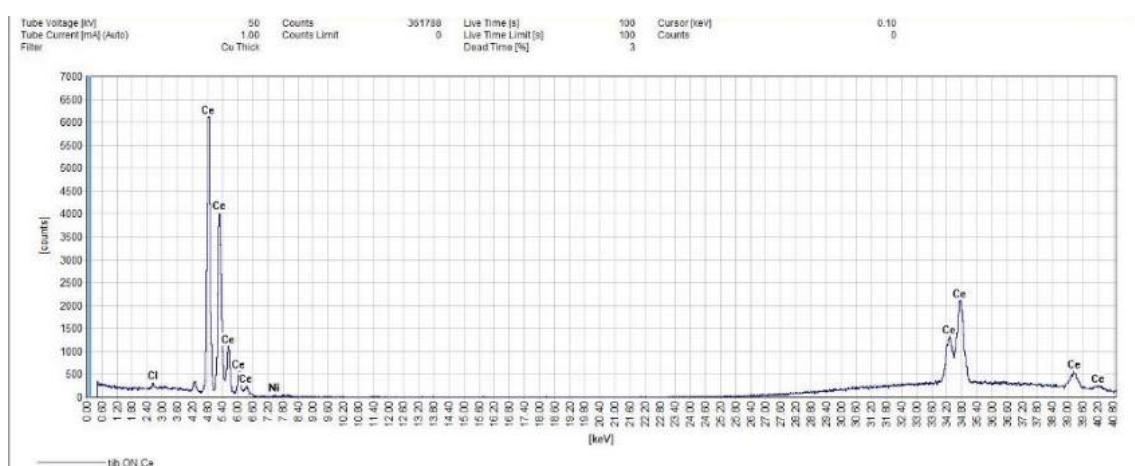
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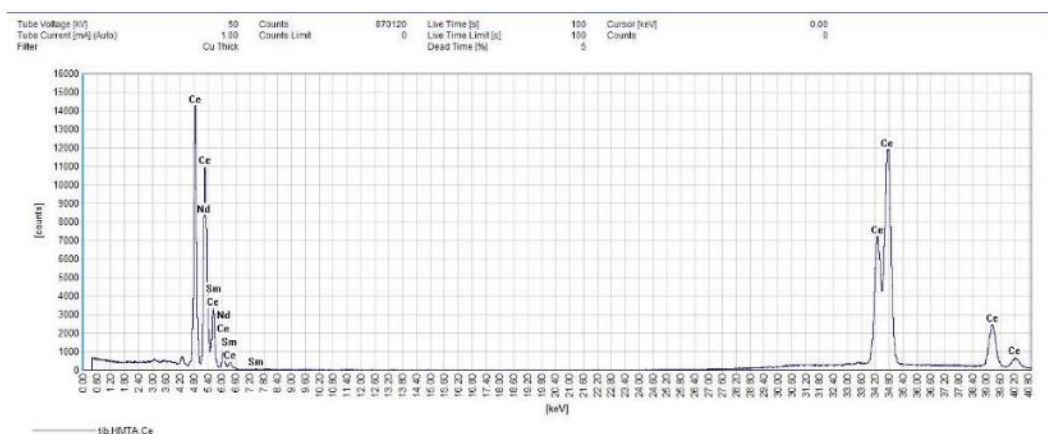
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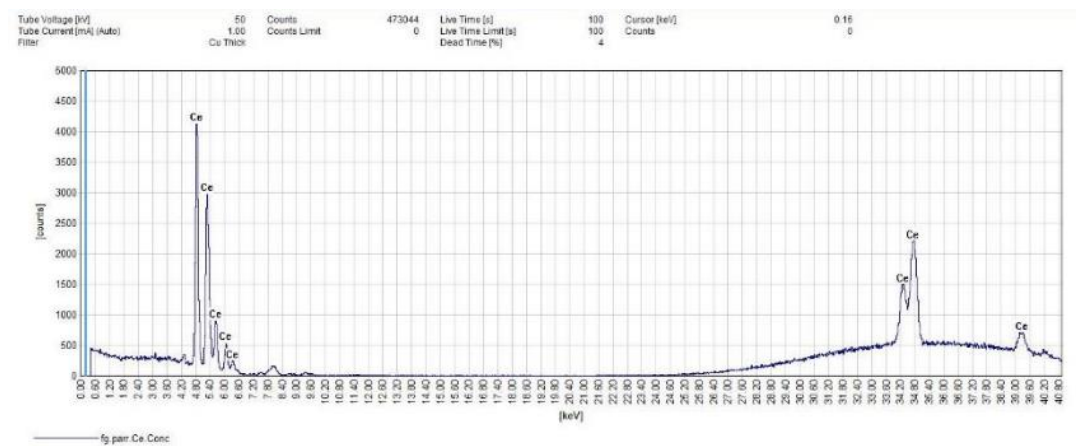
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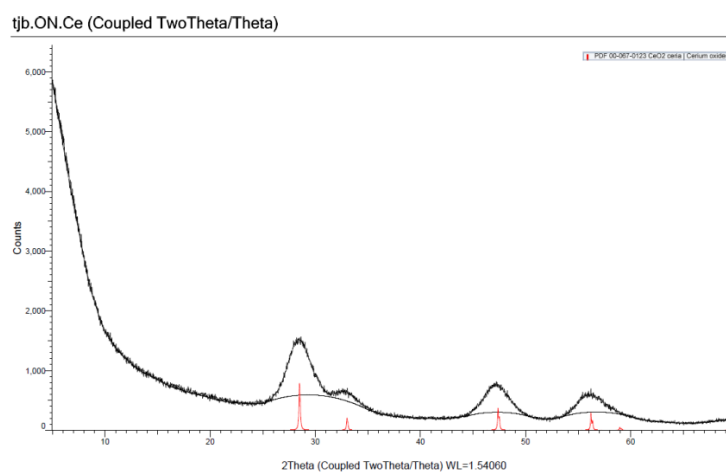
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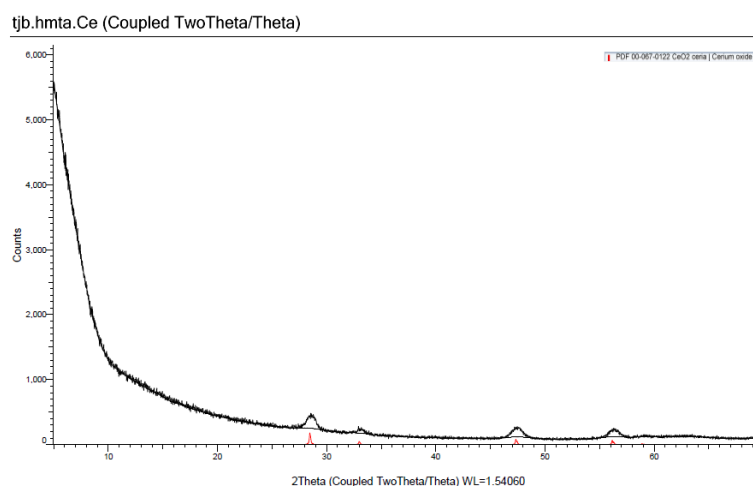
a iii)



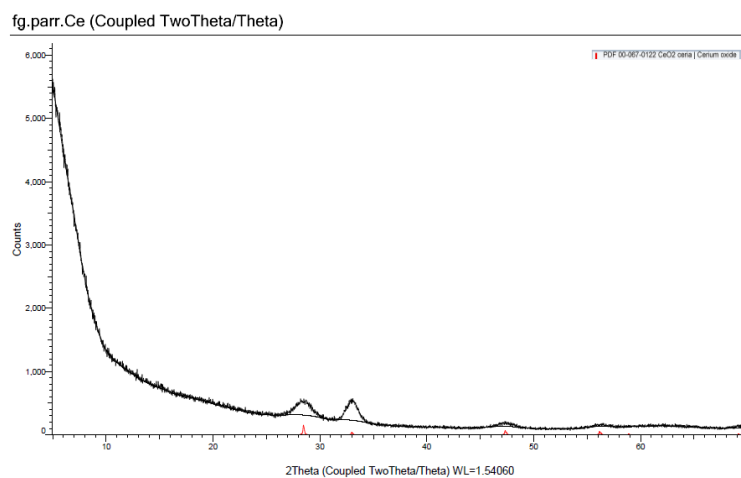
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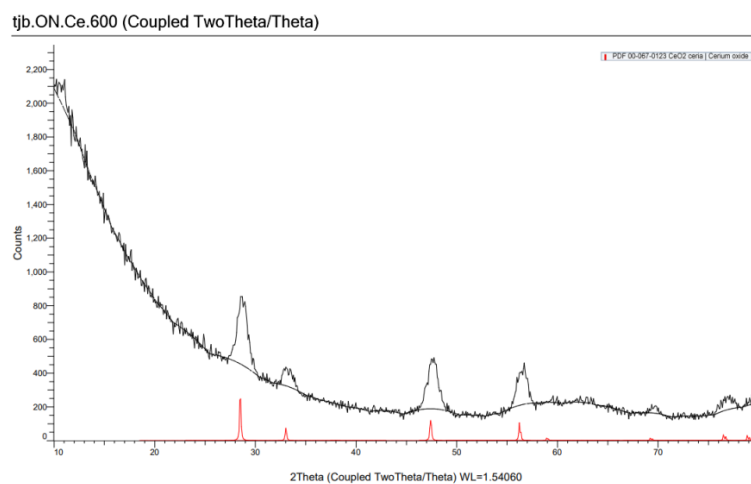
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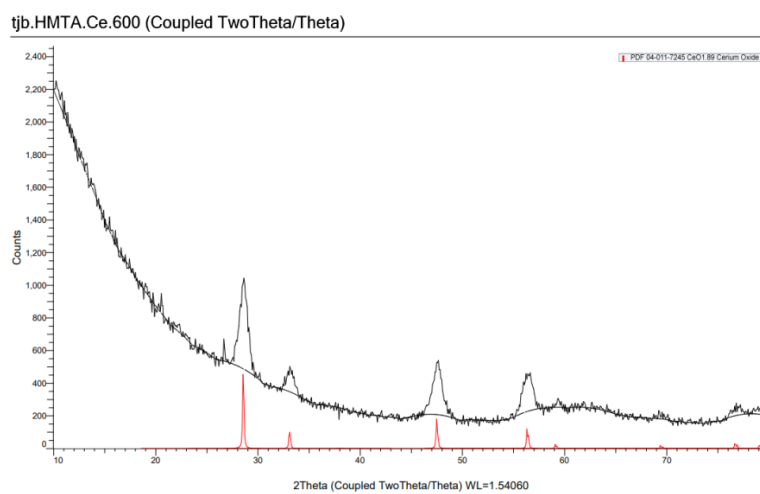
b iii)



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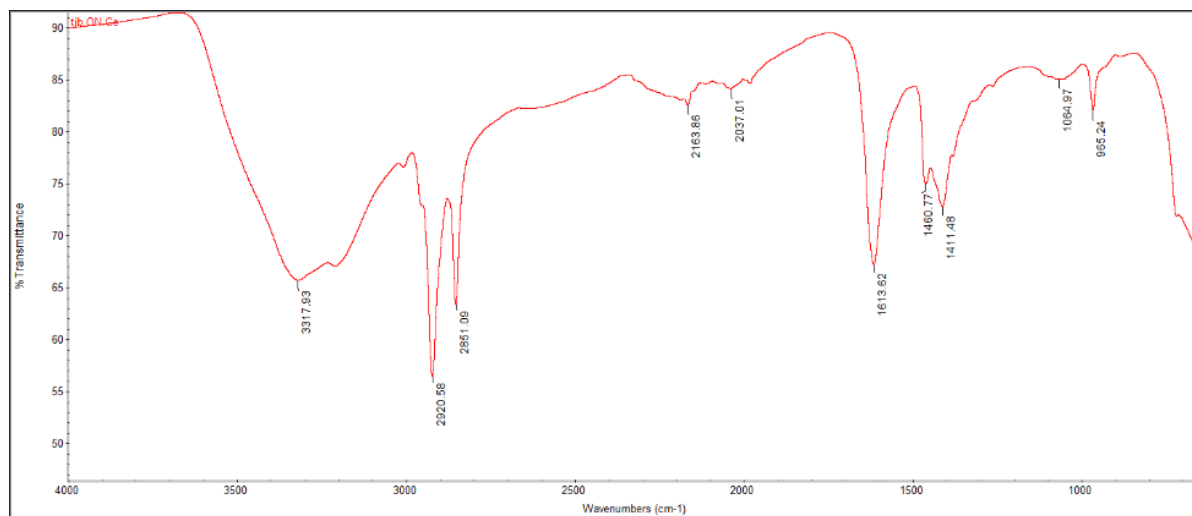
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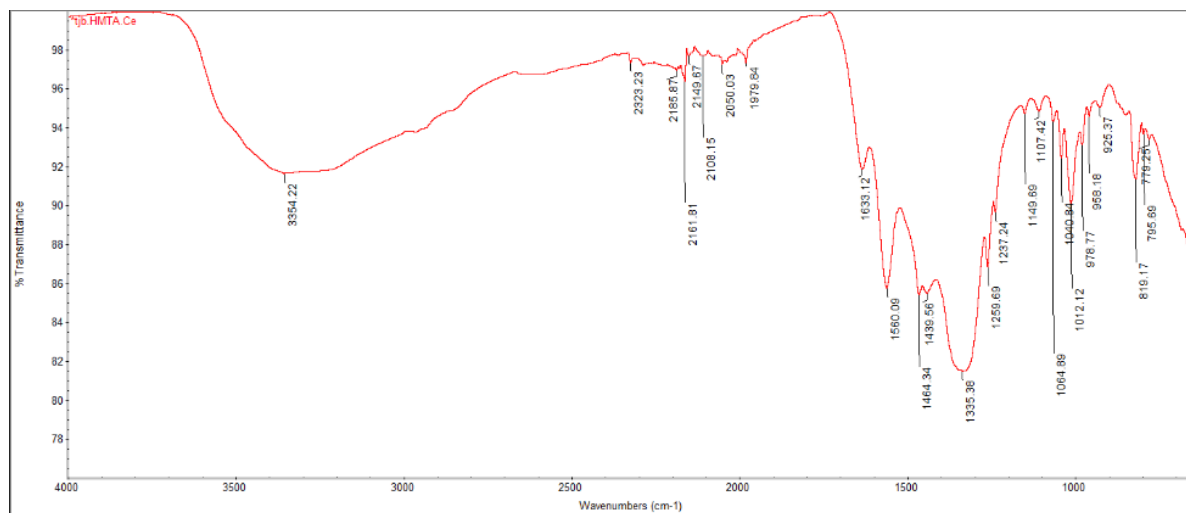
b* iii)

phase already matched

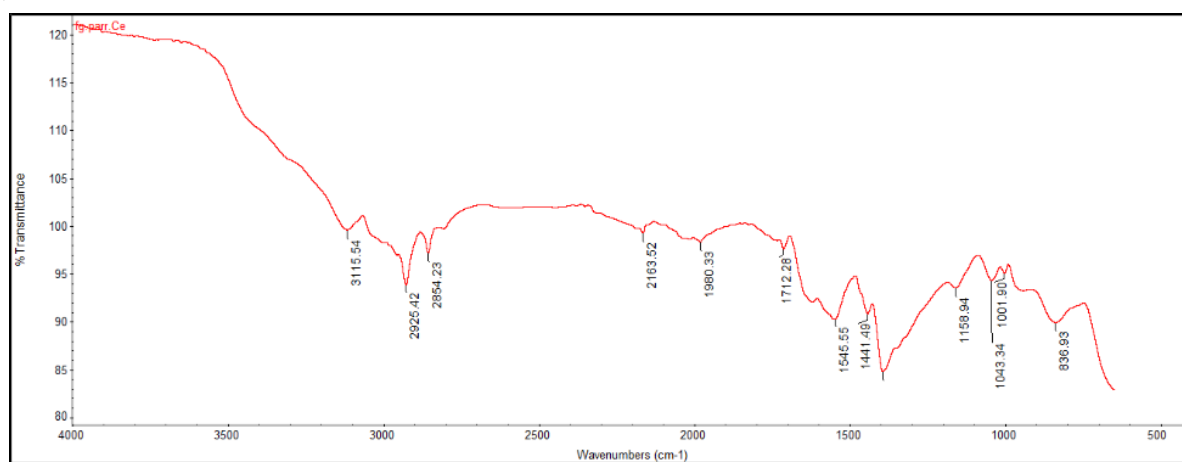
c i)



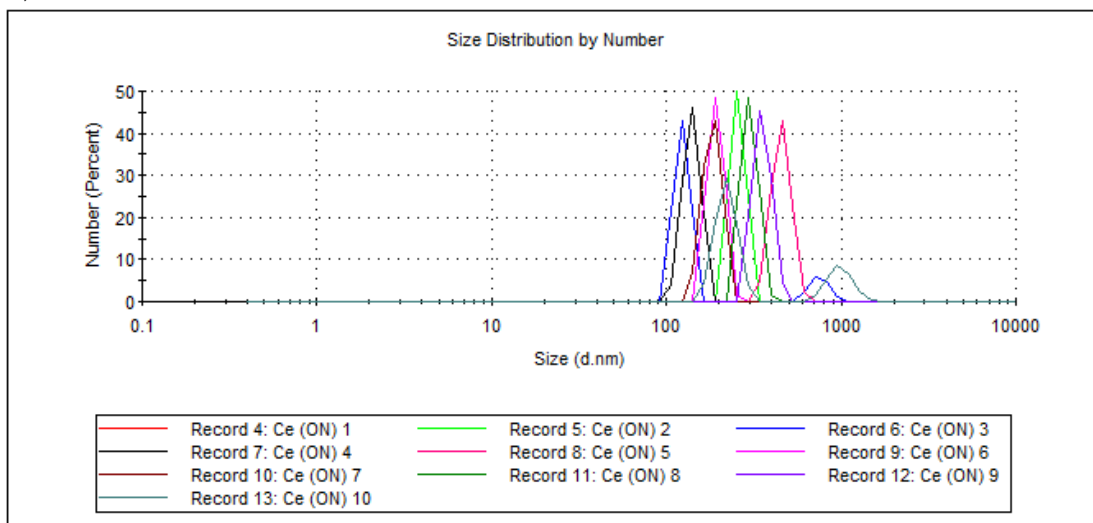
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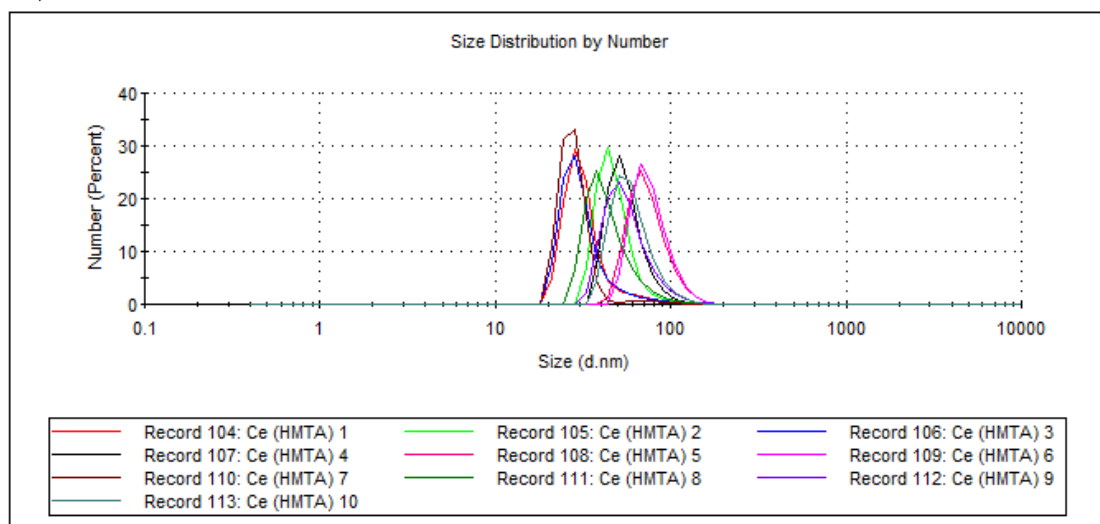
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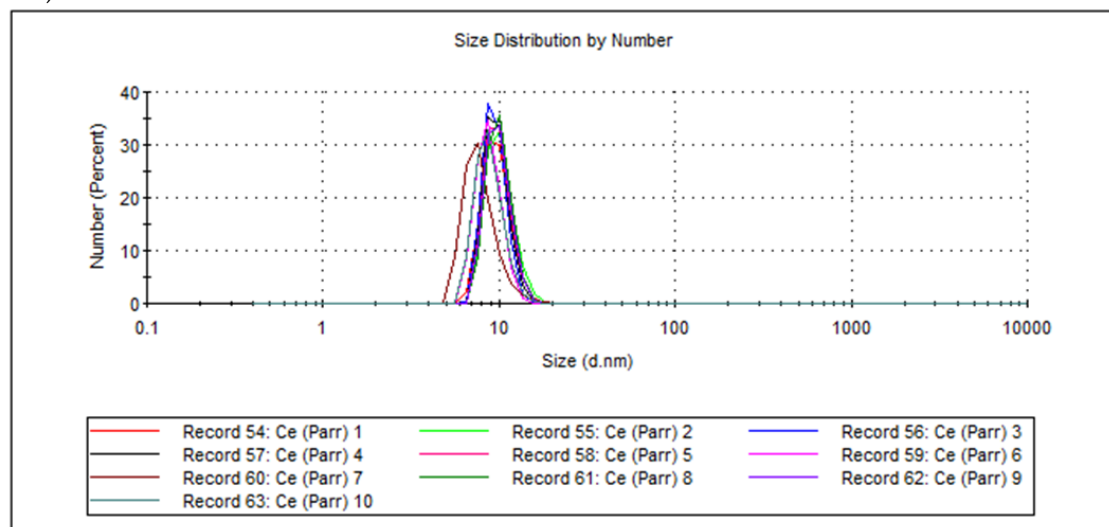
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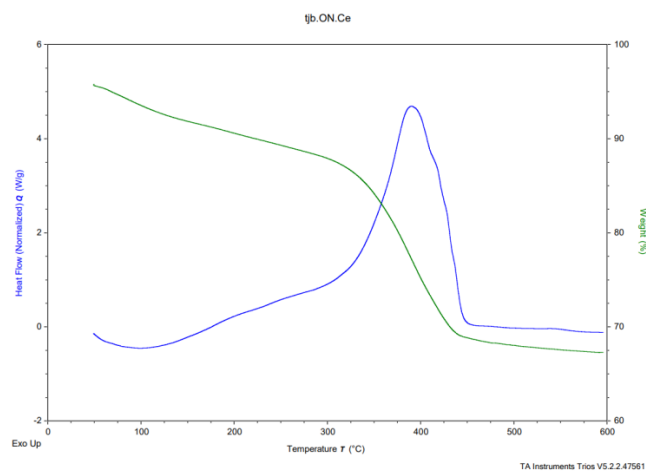
d ii)



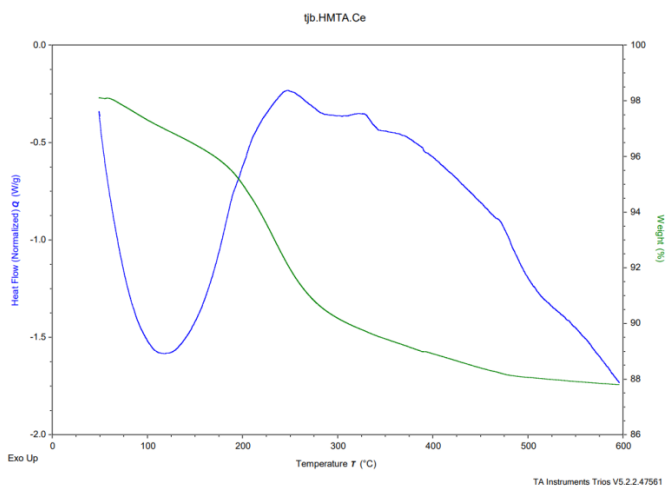
d iii)



e i)



e ii)



e iii)

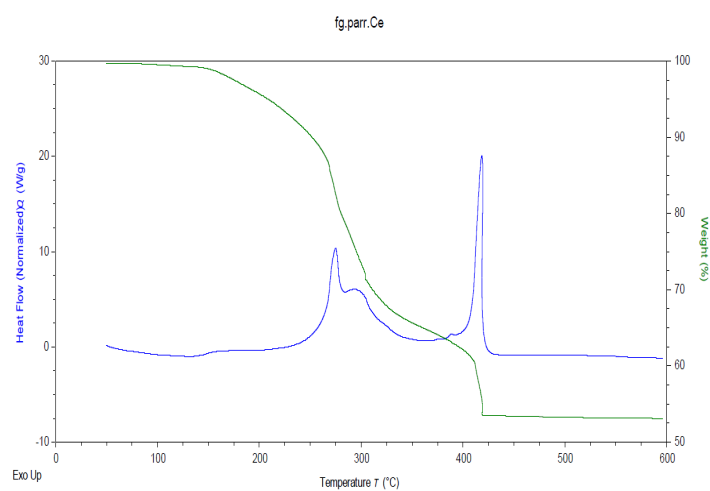
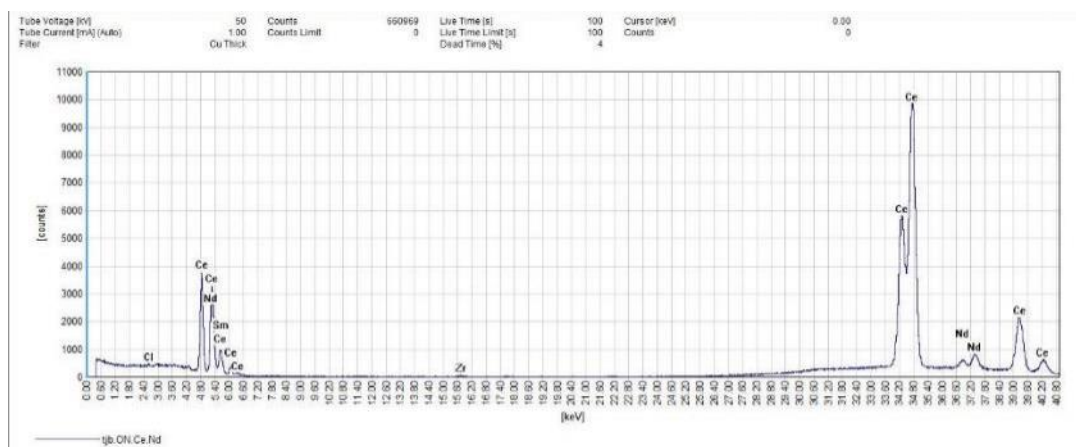
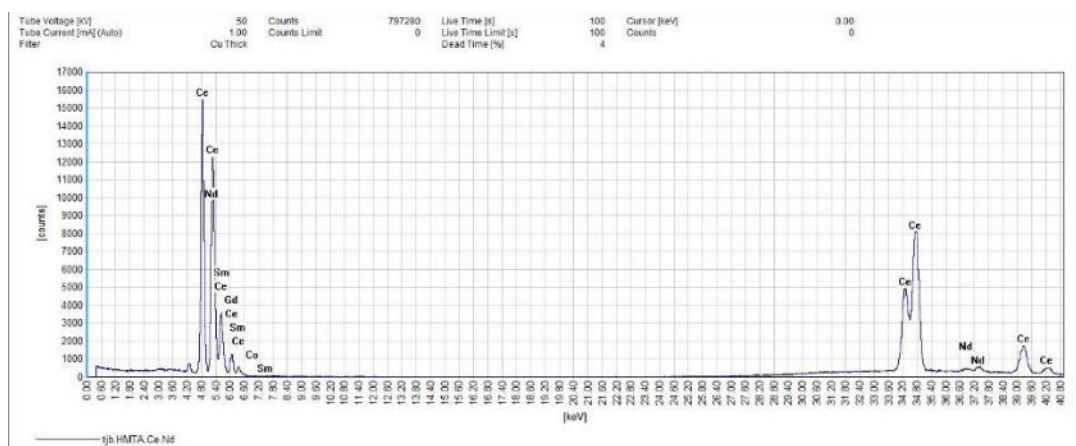


Figure S1. Analytical data for generated CeOx (a) XRF [(i) ON, (ii) HMTA, (iii) TBA], (b) pXRD RT [(i) ON, (ii) HMTA, (iii) TBA], (b*) pXRD 600°C [(i) ON, (ii) HMTA, (iii) TBA], (c) FTIR [(i) ON, (ii) HMTA, (iii) TBA], (d) DLS [(i) ON, (ii) HMTA, (iii) TBA], (e) TGA/DSC [(i) ON, (ii) HMTA, (iii) TBA].

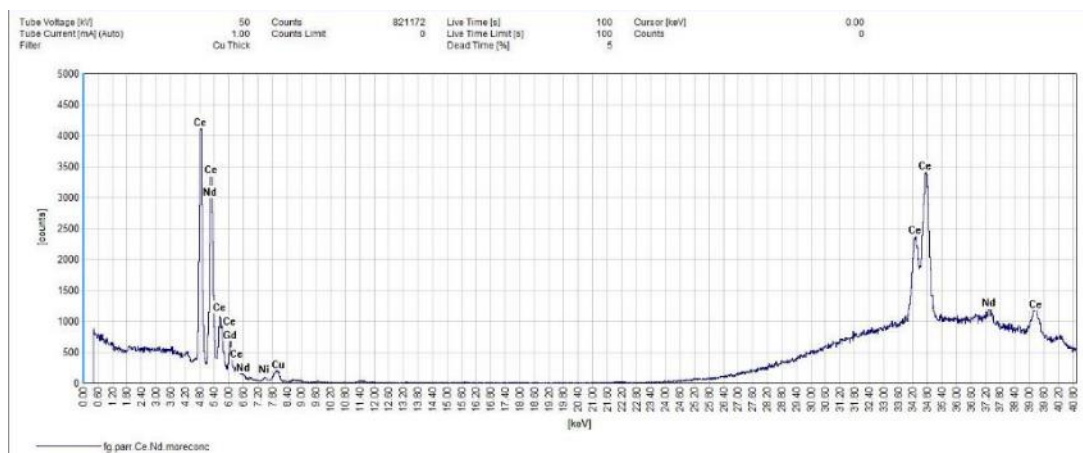
a i)



a ii)

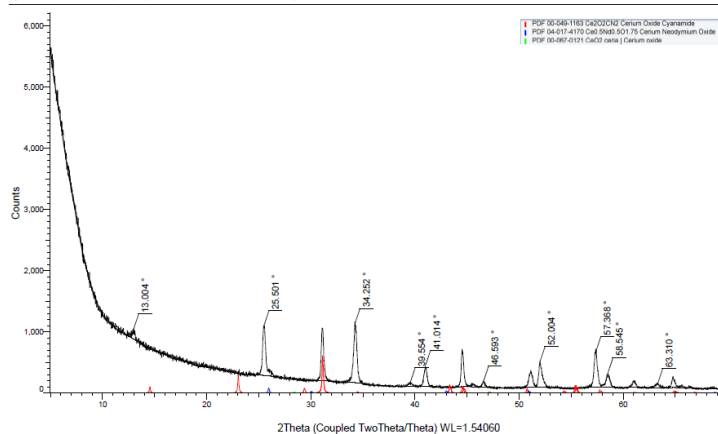


a iii)



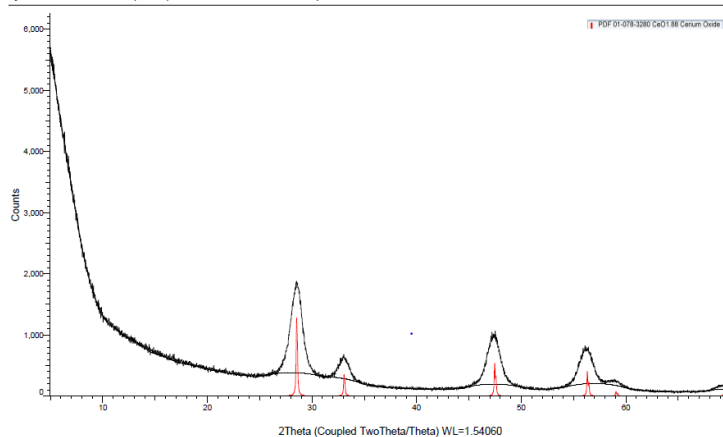
b i)

tjb.ON.Ce.Nd (Coupled TwoTheta/Theta)



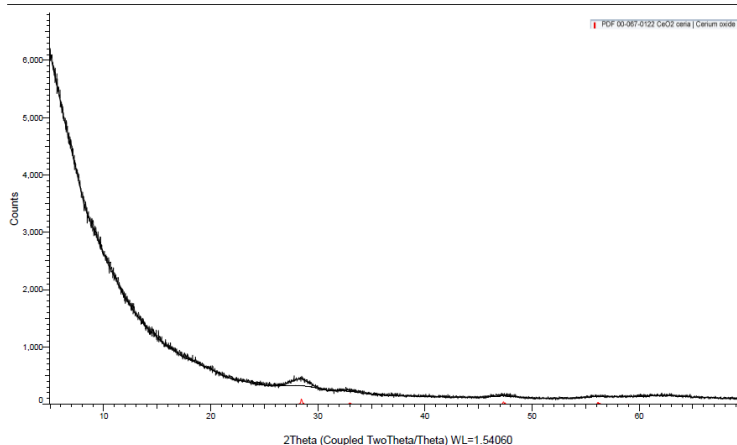
b ii)

tjb.HMTA.Ce.Nd (Coupled TwoTheta/Theta)



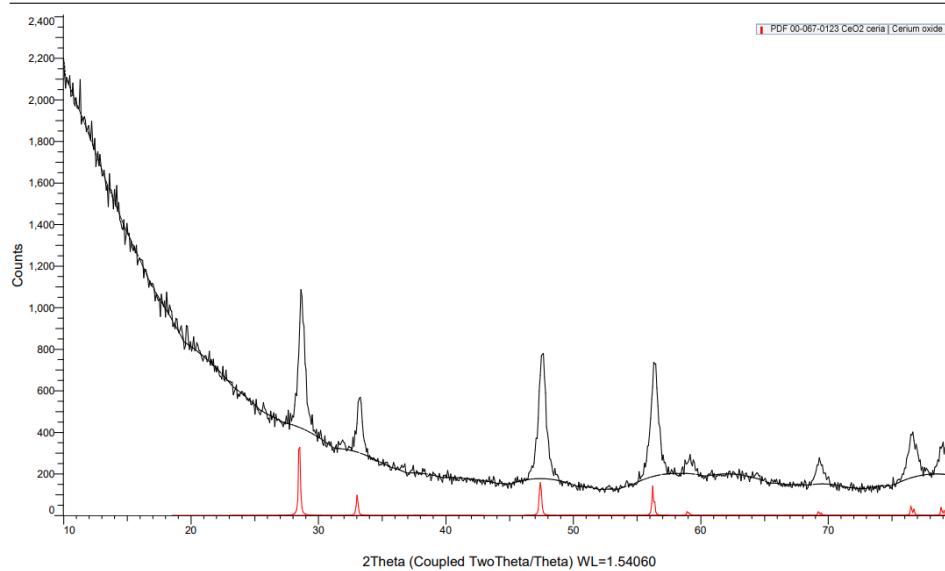
b iii)

fg.parr.Ce.Nd (Coupled TwoTheta/Theta)



b* i)

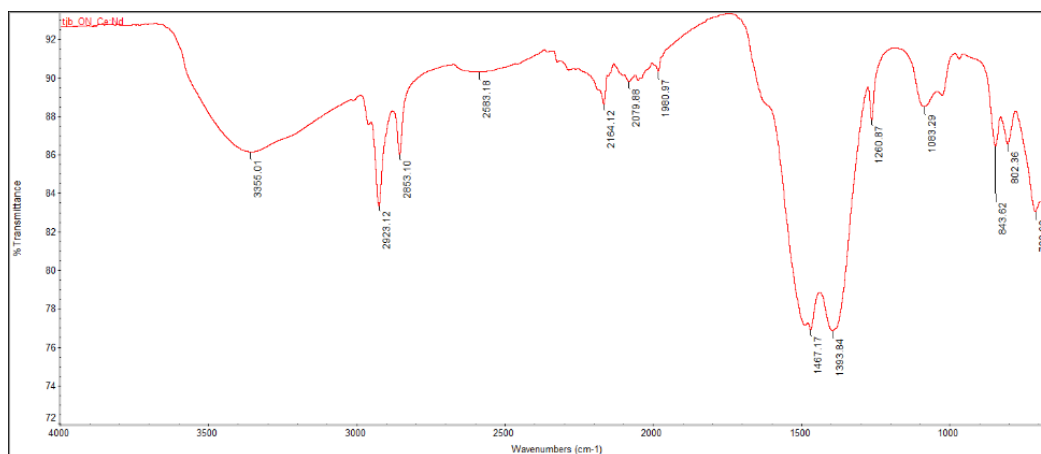
tjb.ON.Ce.Nd.600 (Coupled TwoTheta/Theta)



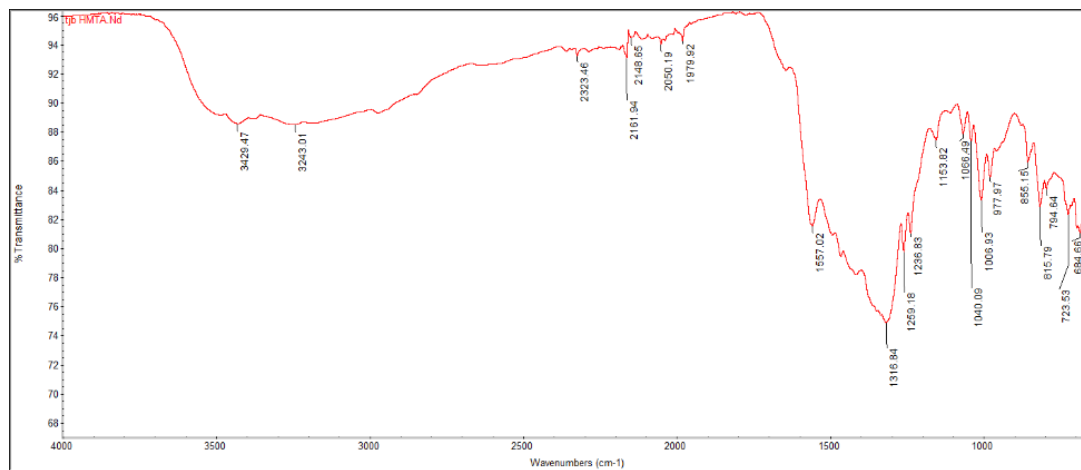
b* ii) phase already matches

b* iii) phase already matches

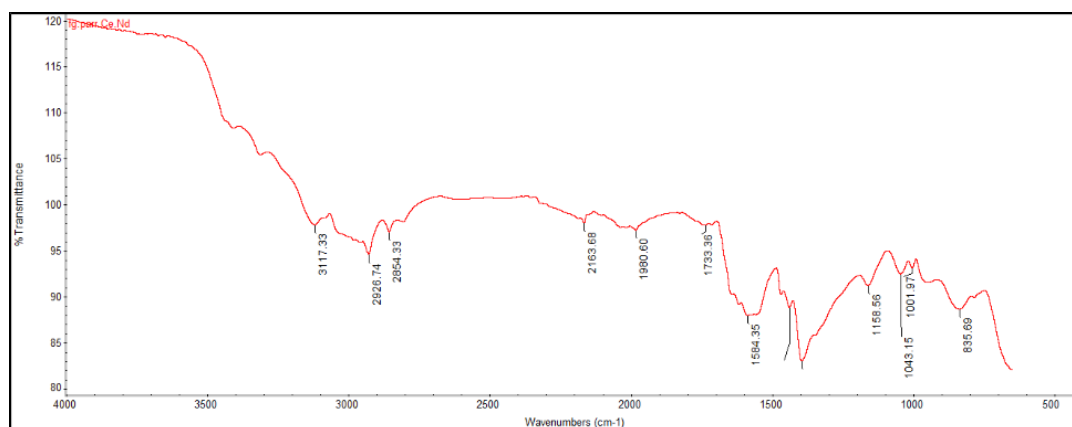
c i)



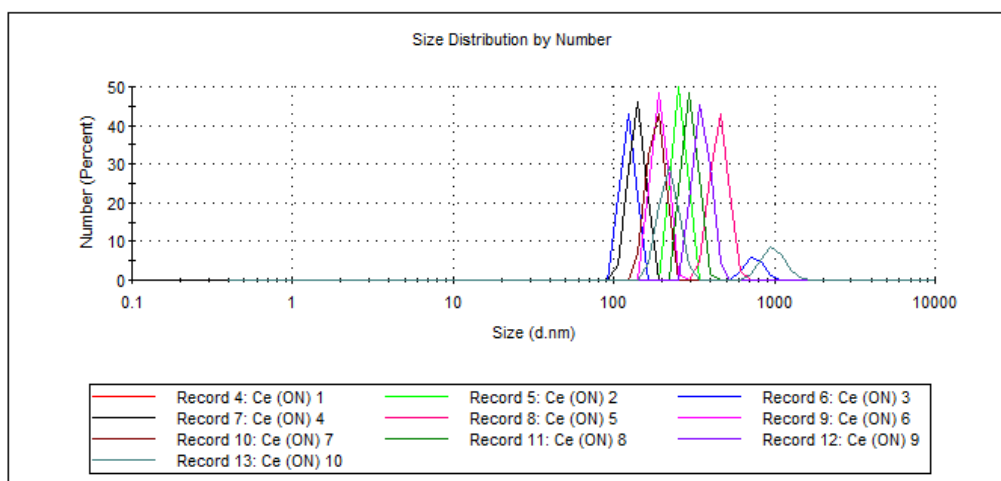
c ii)



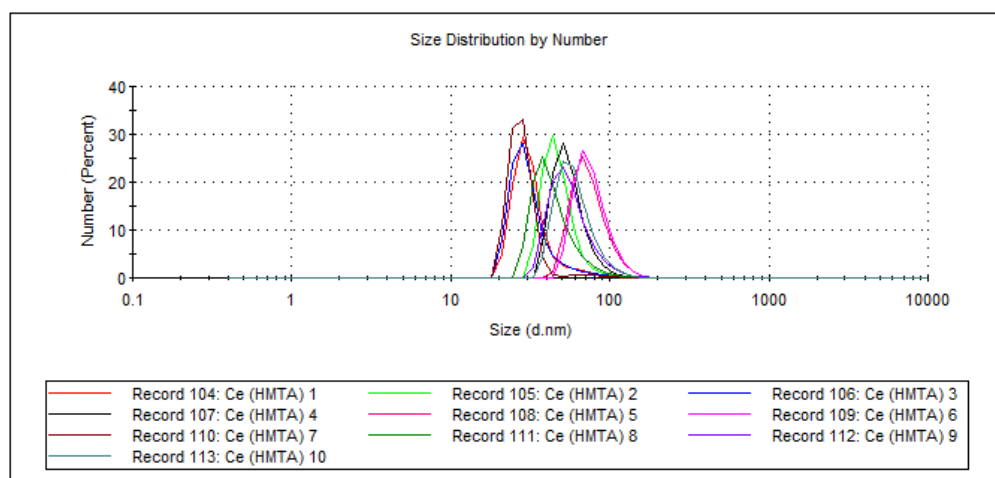
c iii)



d i)



d ii)



d iii)

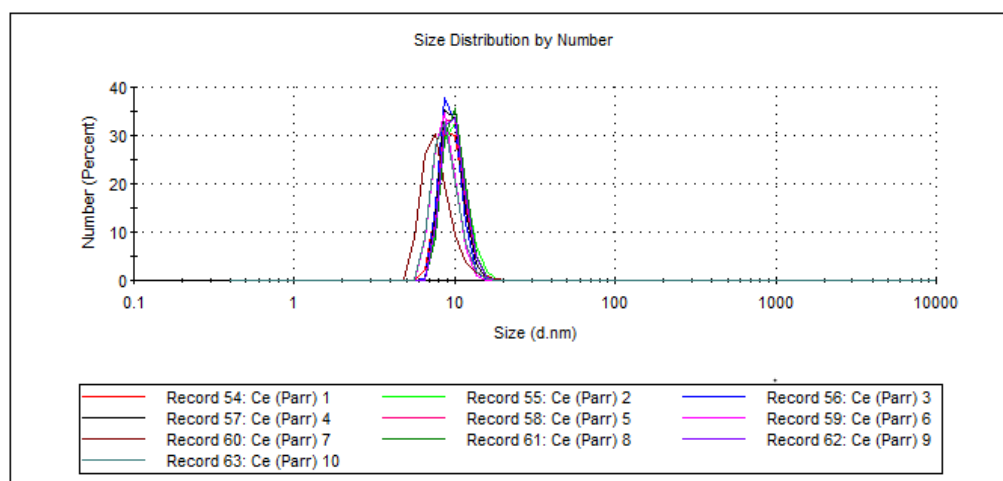
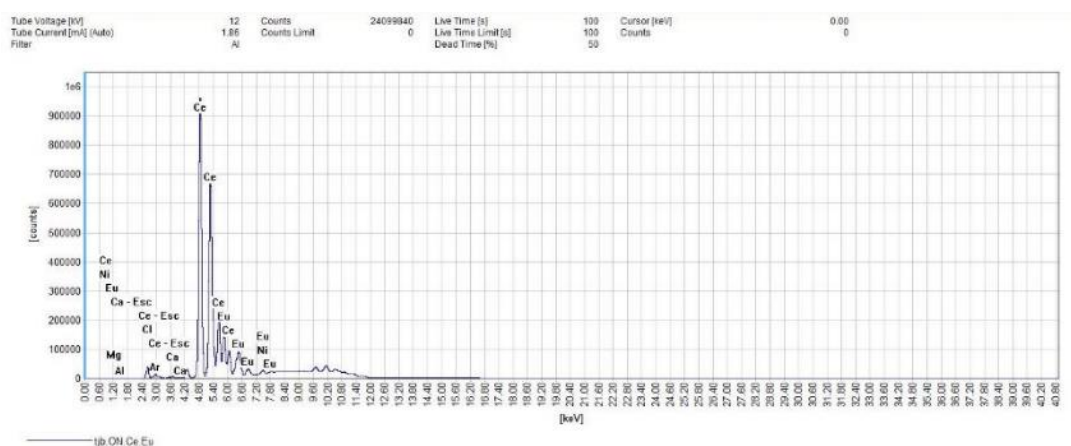
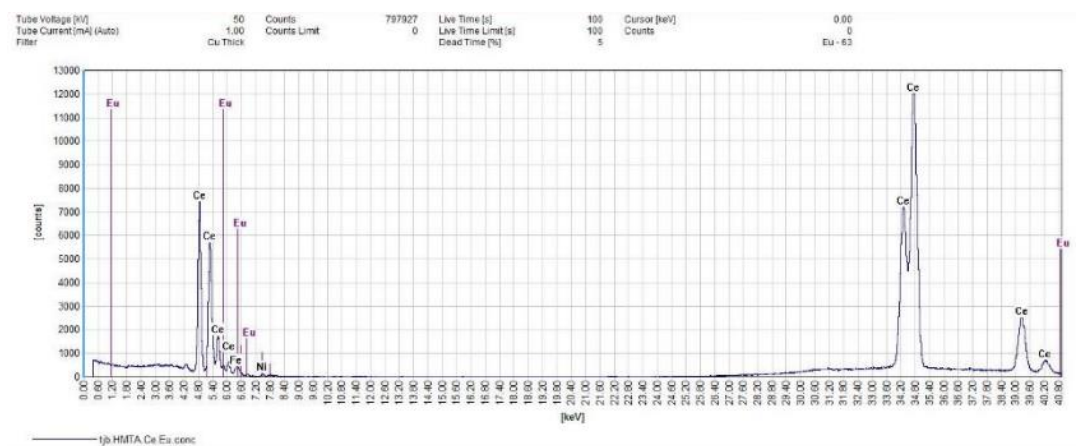


Figure S2. Analytical data for generated Nd:CeO_x (a) XRF [(i) ON, (ii) HMTA, (iii) TBA], (b) pXRD RT [(i) ON, (ii) HMTA, (iii) TBA], (b*) pXRD 600°C [(i) ON, (ii) HMTA, (iii) TBA], (c) FTIR [(i) ON, (ii) HMTA, (iii) TBA], (d) DLS [(i) ON, (ii) HMTA, (iii) TBA].

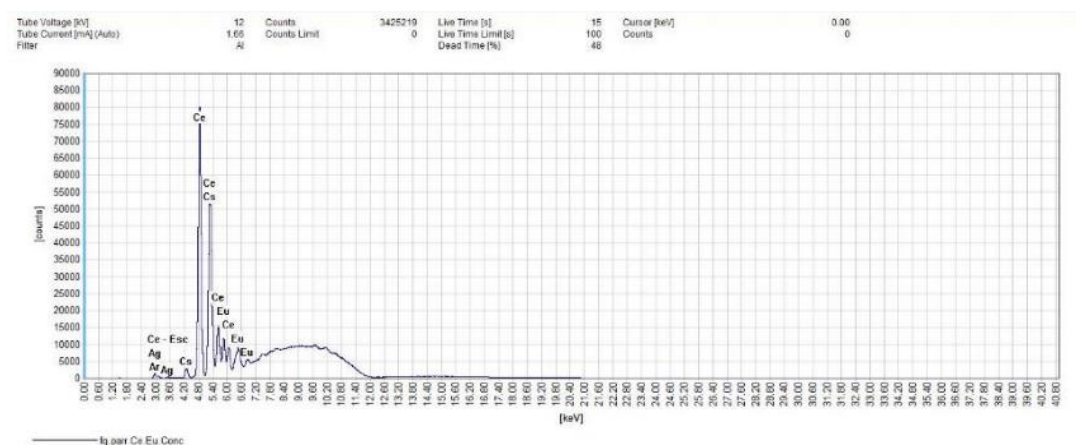
a i)



a ii)

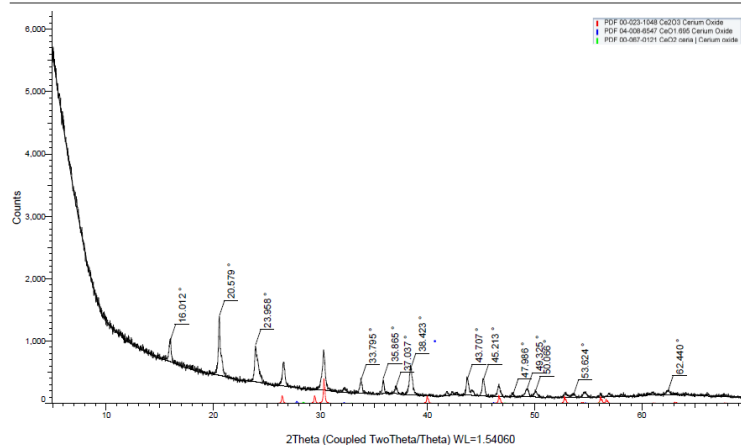


a iii)



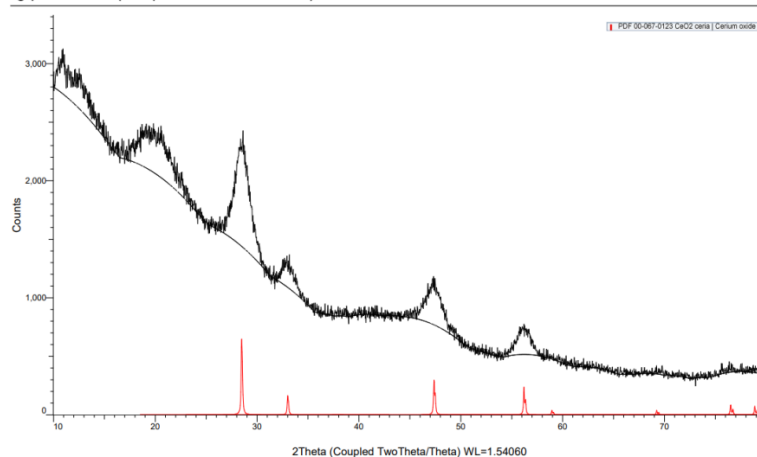
b ii)

tjb.HMTA.Ce.Eu (Coupled TwoTheta/Theta)



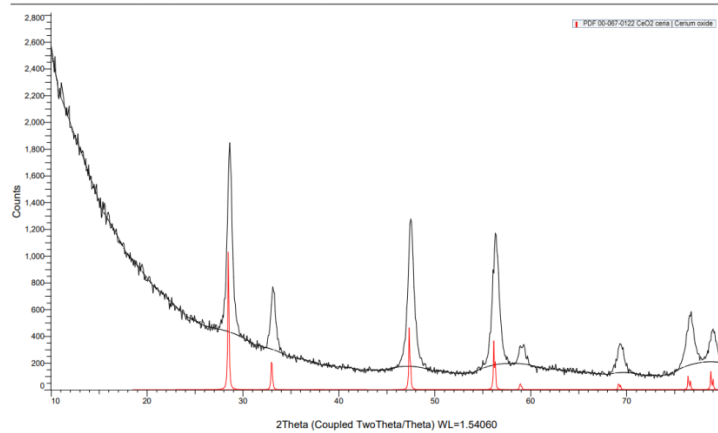
b iii)

fg.parr.Ce.Eu (Coupled TwoTheta/Theta)

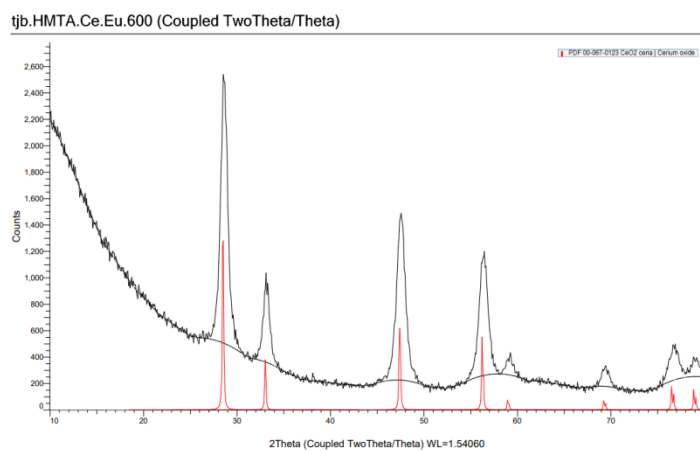


b* i)

tjb.ON.Ce.Eu.600 (Coupled TwoTheta/Theta)

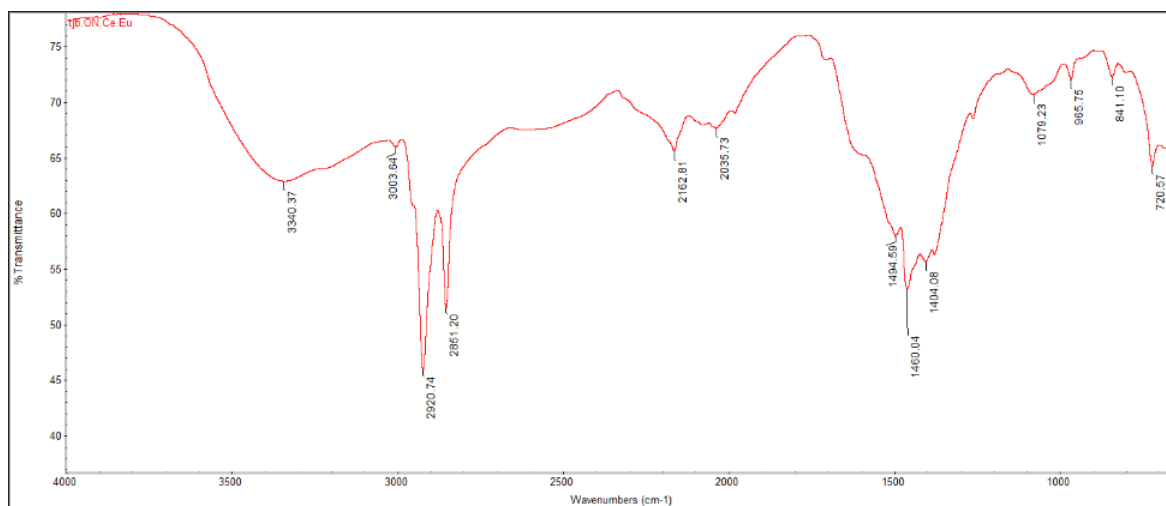


b* ii)

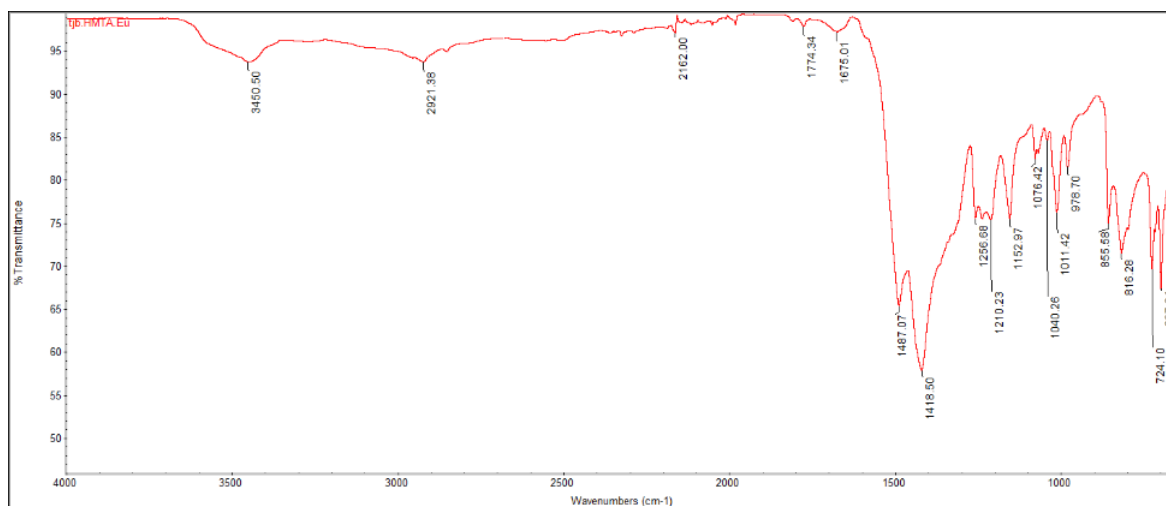


b* iii) phase already matches

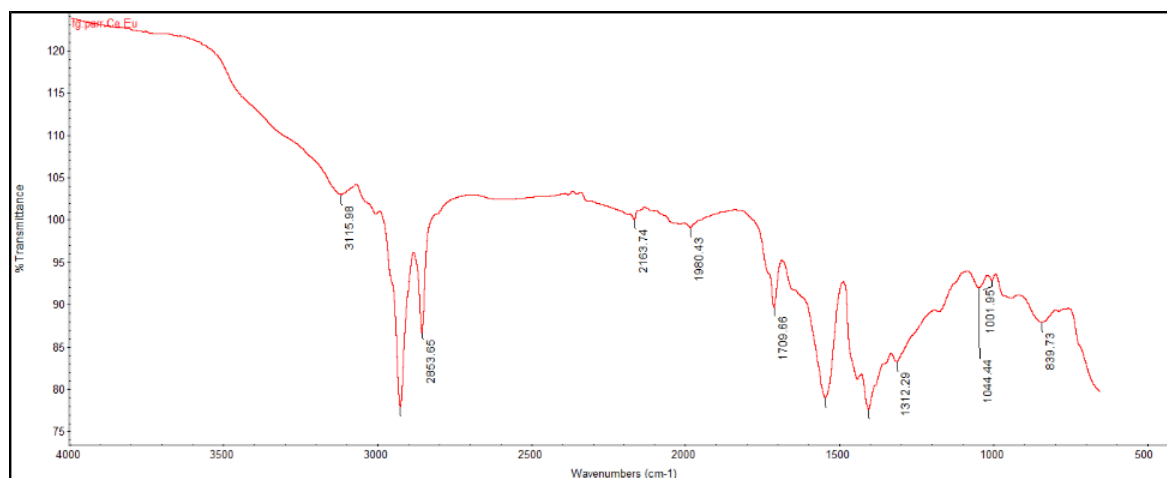
c i)



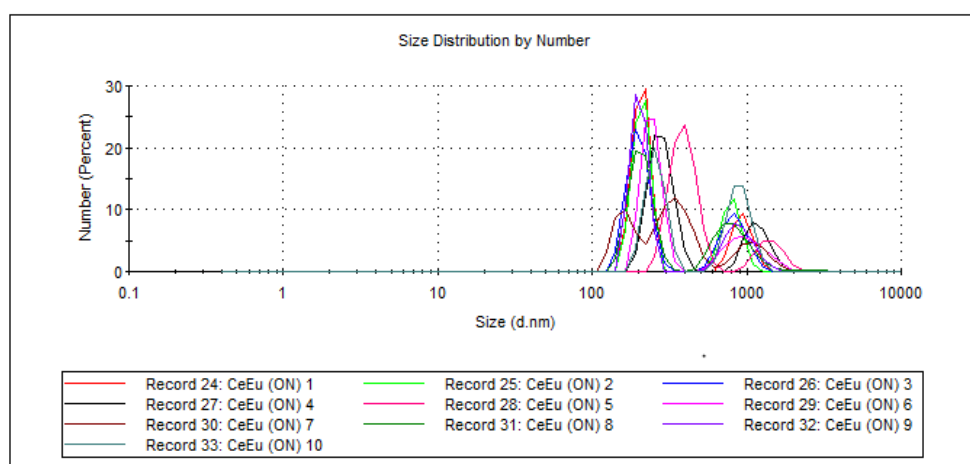
c ii)



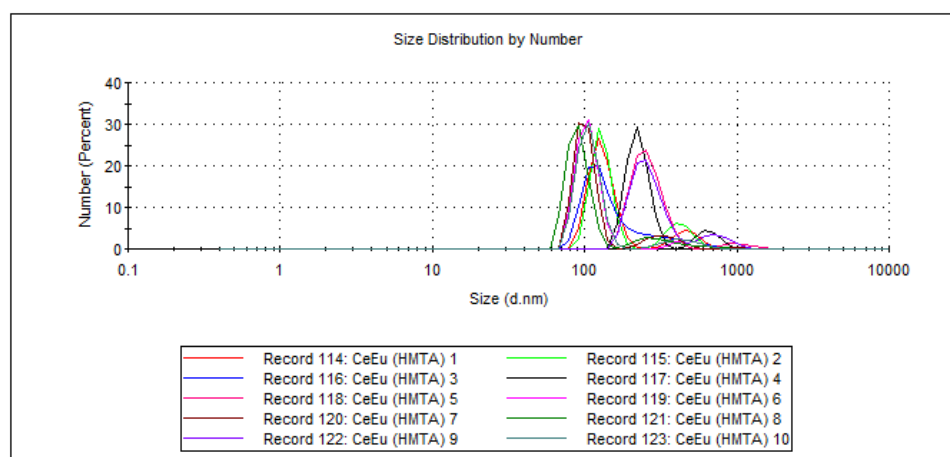
c iii)



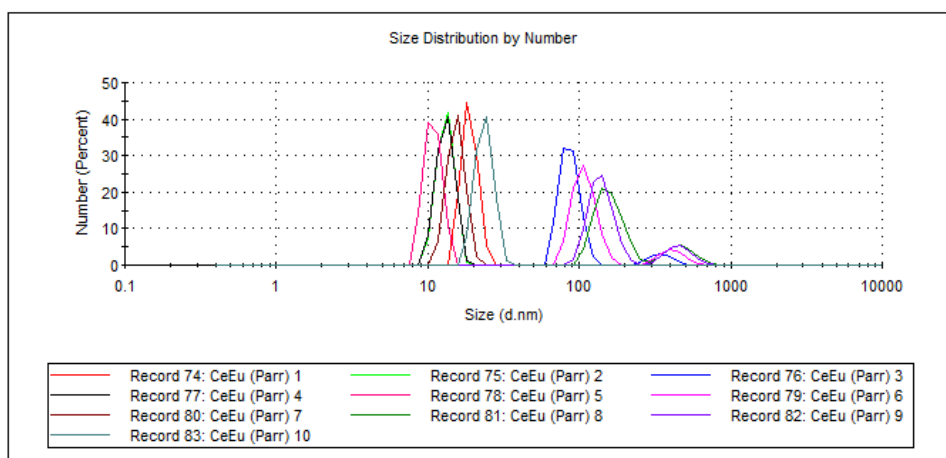
d i)



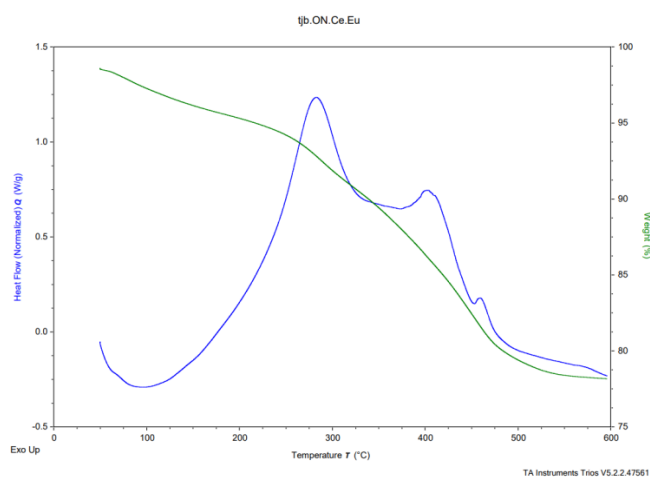
d ii)



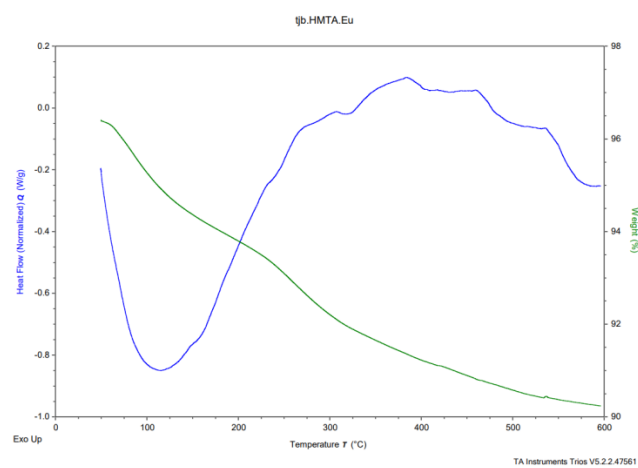
d iii)



e i)



e ii)



e iii)

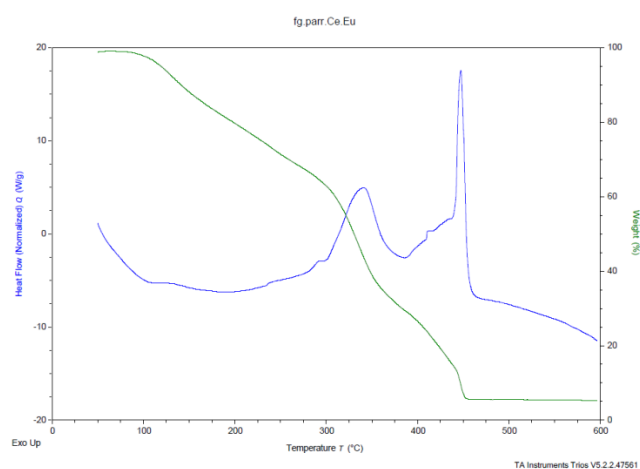
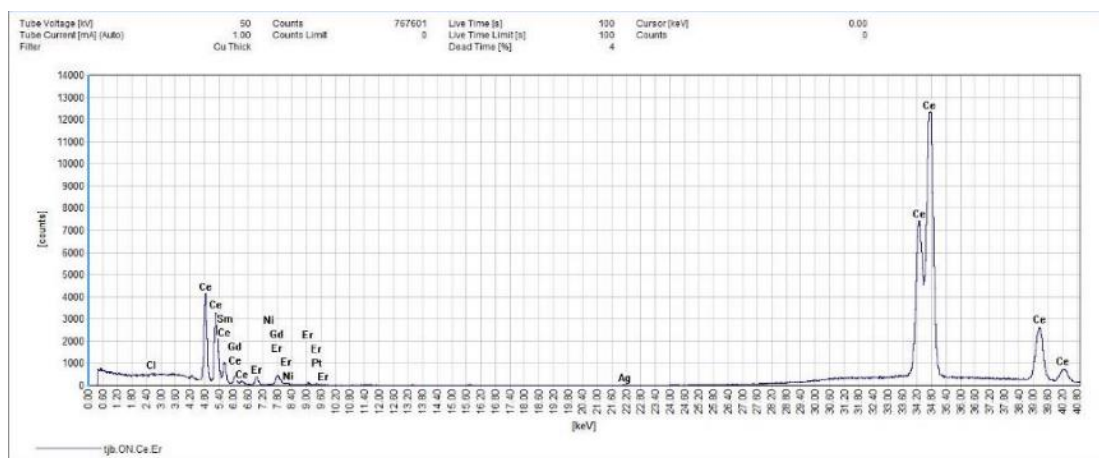
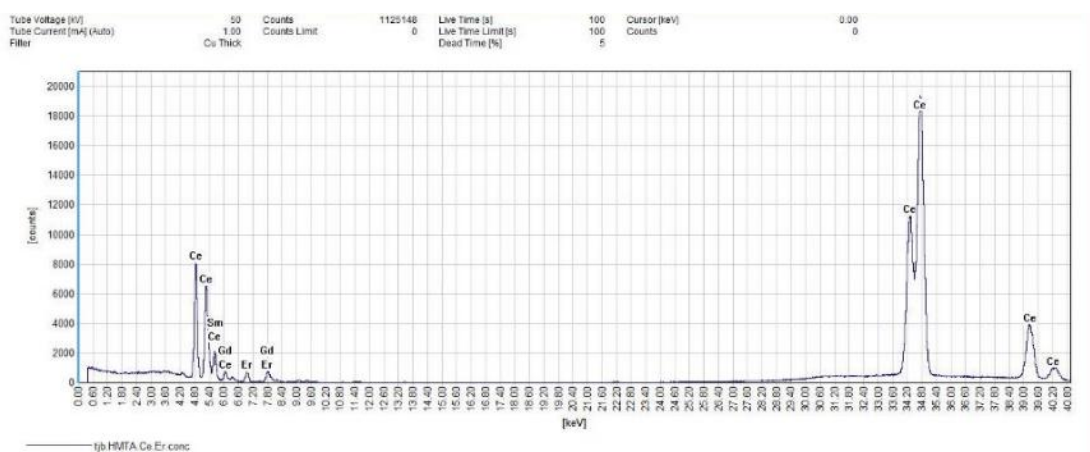


Figure S3. Analytical data for generated Eu:CeO_x (a) XRF [(i) ON, (ii) HMTA, (iii) TBA], (b) pXRD RT [(i) ON, (ii) HMTA, (iii) TBA], (b*) pXRD 600°C [(i) ON, (ii) HMTA, (iii) TBA], (c) FTIR [(i) ON, (ii) HMTA, (iii) TBA], (d) DLS [(i) ON, (ii) HMTA, (iii) TBA], (e) TGA/DSC [(i) ON, (ii) HMTA, (iii) TBA].

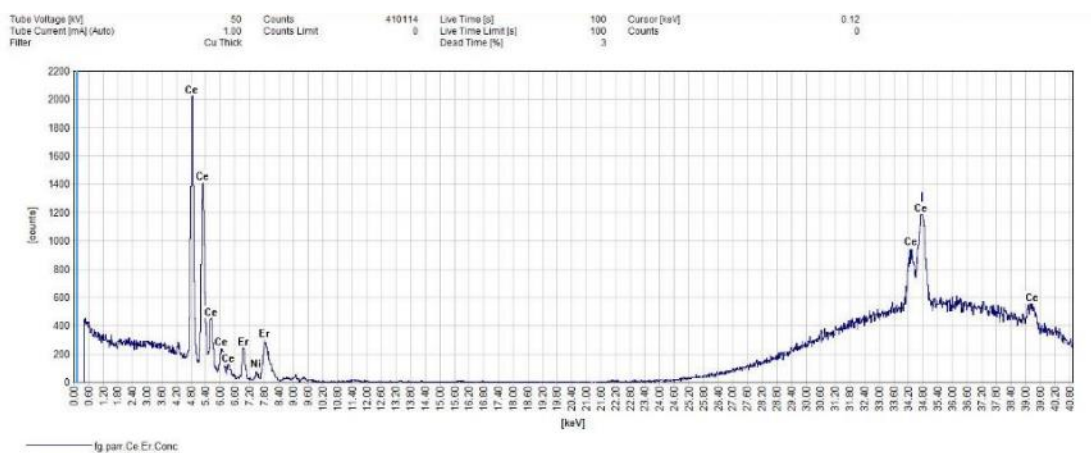
a i)



a ii)

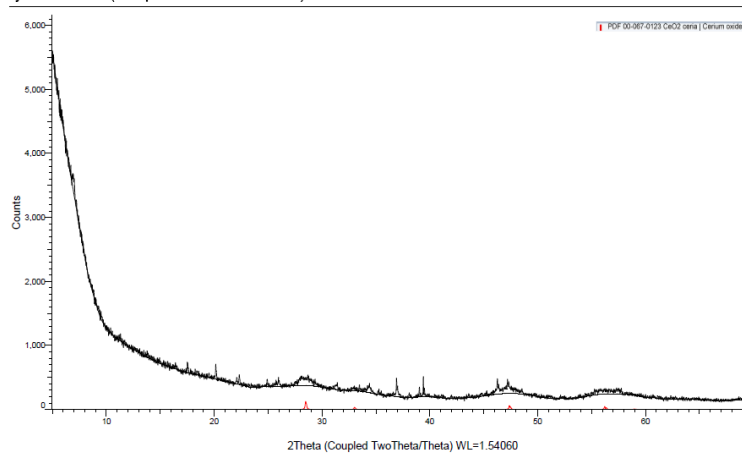


a iii)



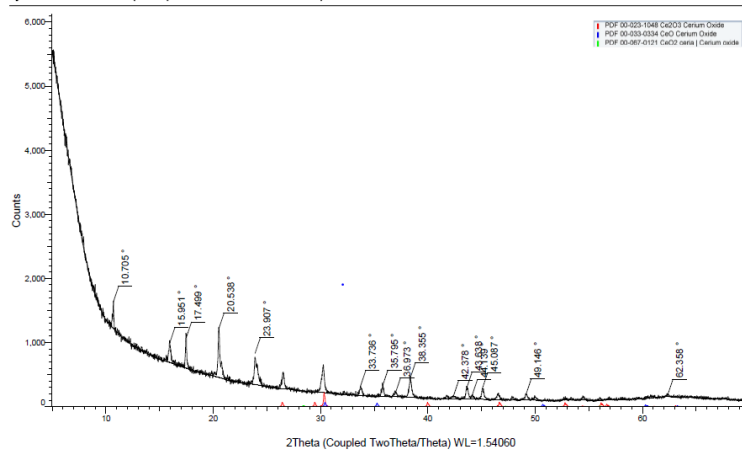
b i)

tjb.ON.Ce.Er (Coupled TwoTheta/Theta)

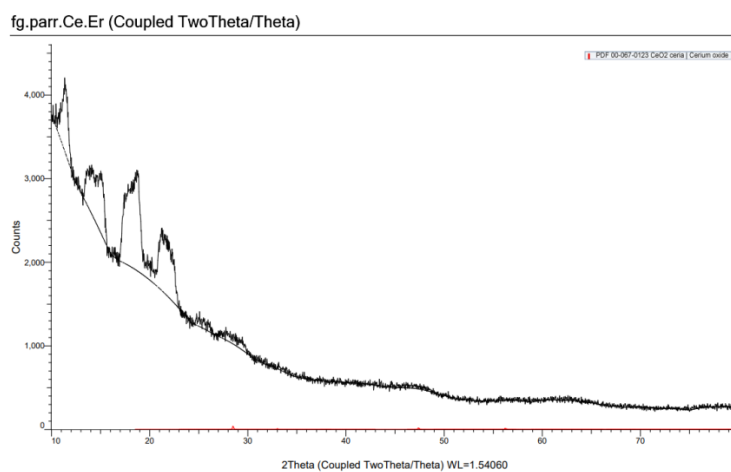


b ii)

tjb.HMTA.Ce.Er (Coupled TwoTheta/Theta)

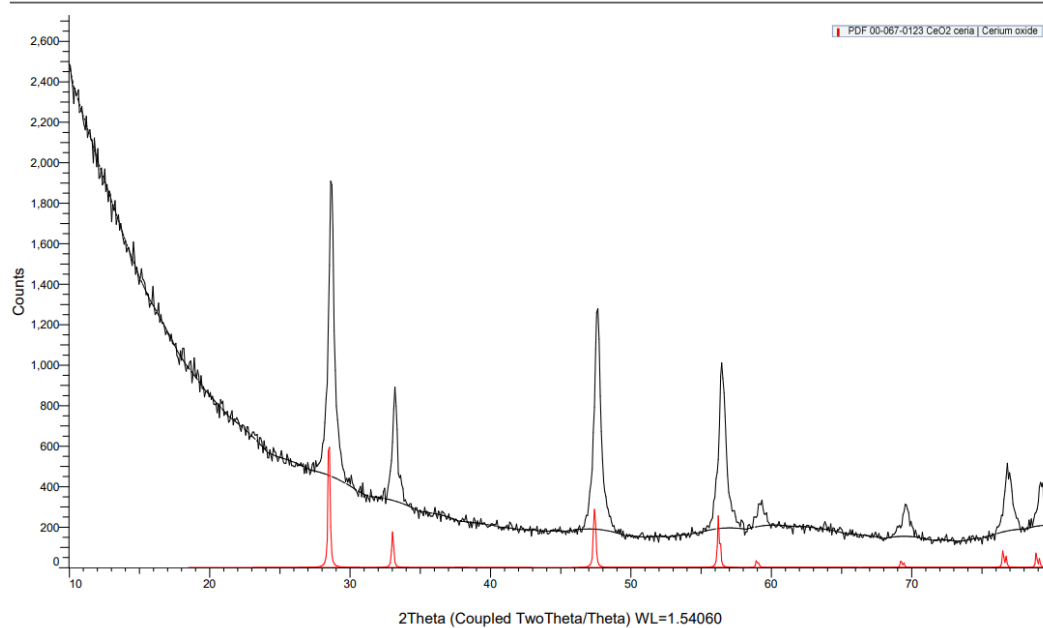


b iii)



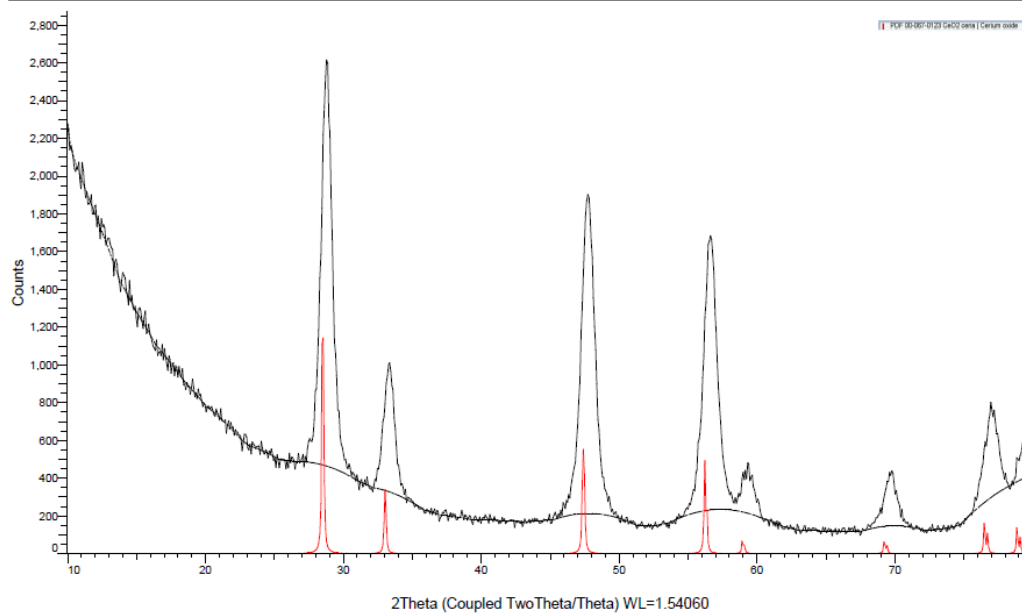
b* i)

tjb.ON.Ce.Er.600 (Coupled TwoTheta/Theta)



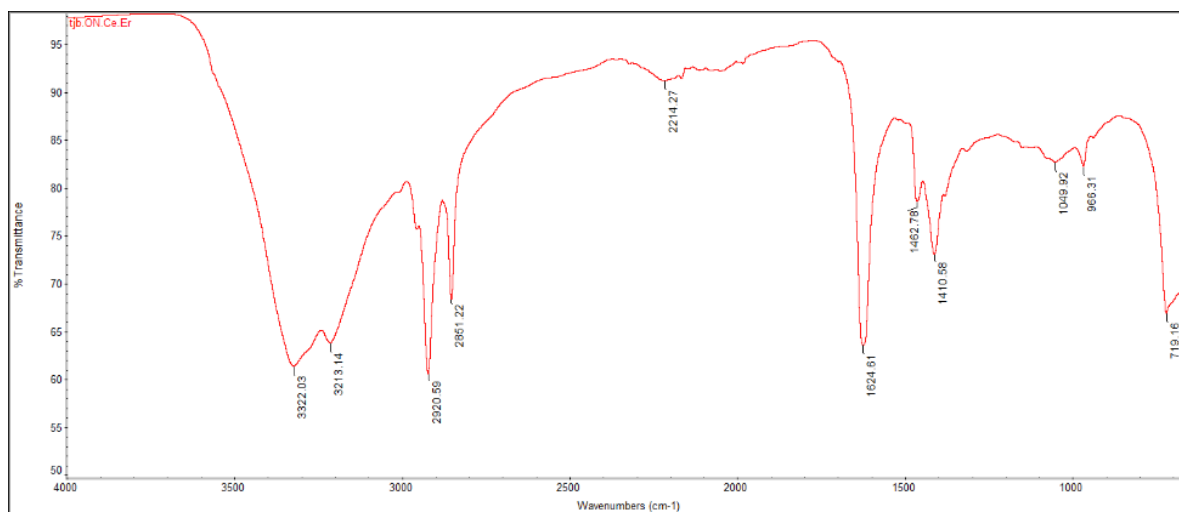
b* ii)

tjb.HMTA.Ce.Er.600 (Coupled TwoTheta/Theta)

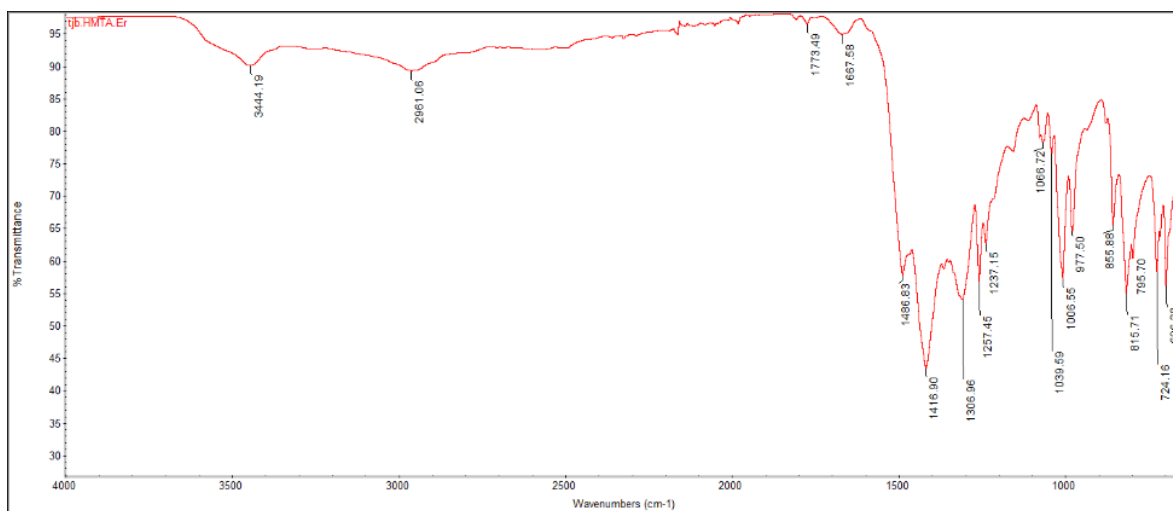


b* iii) phase already matches

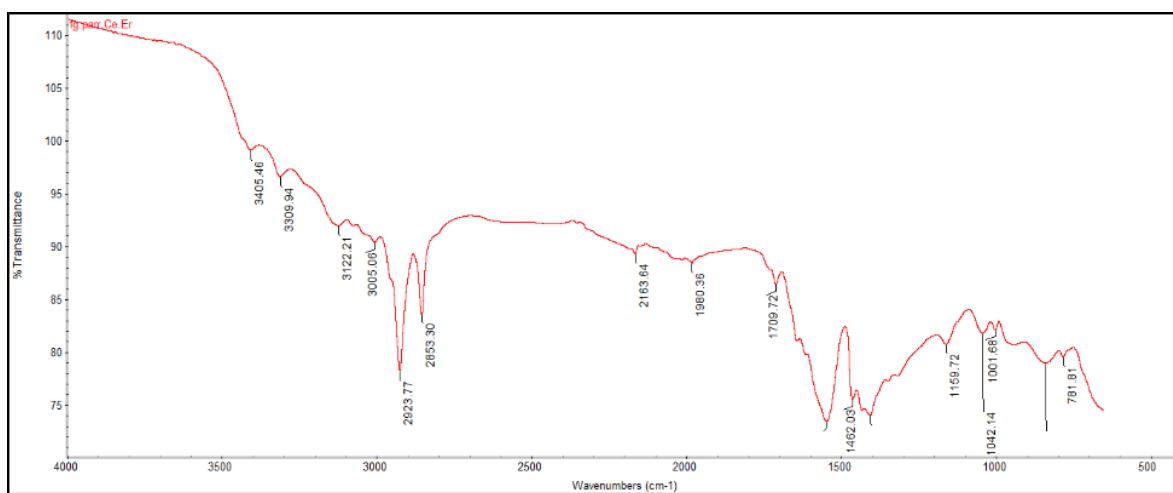
c i)



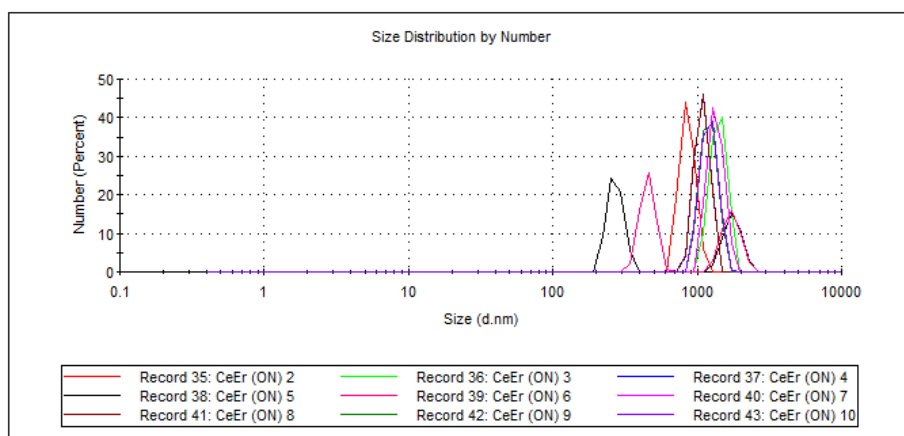
c ii)



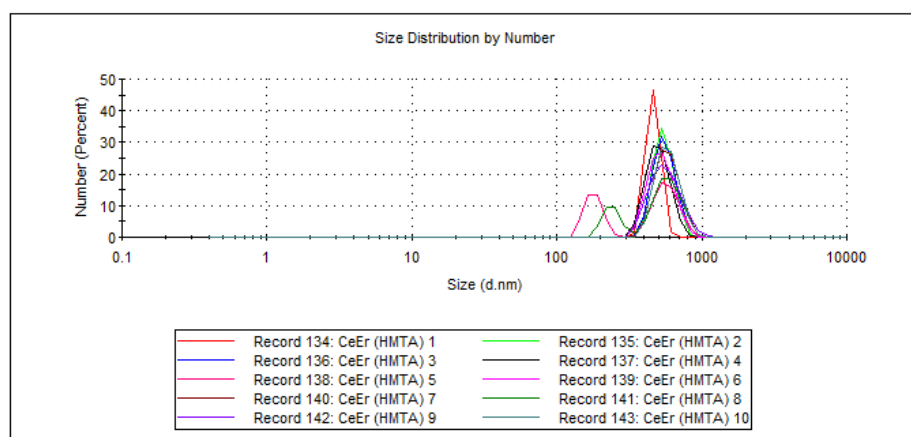
c iii)



d i)



d ii)



d iii)

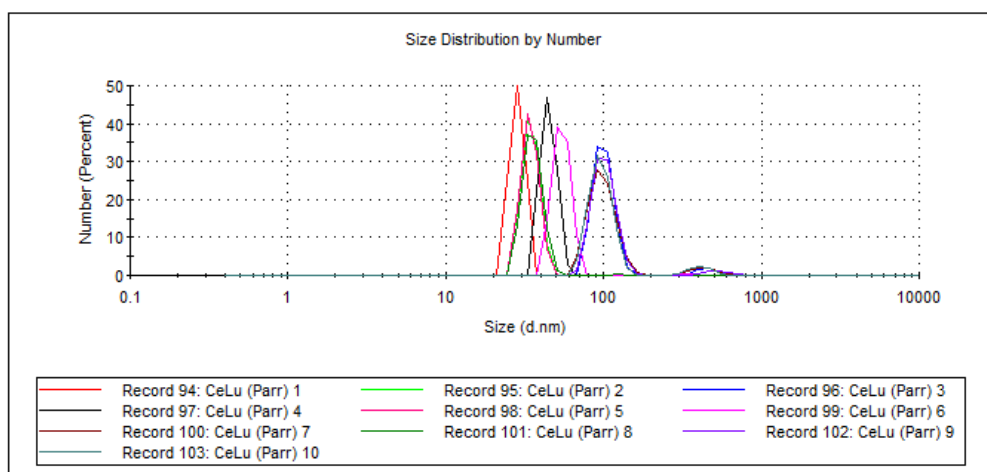
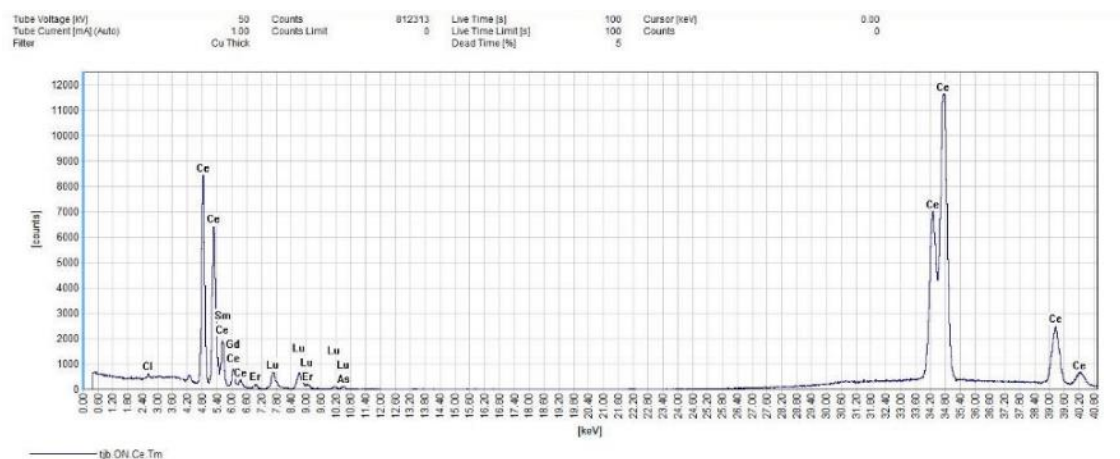
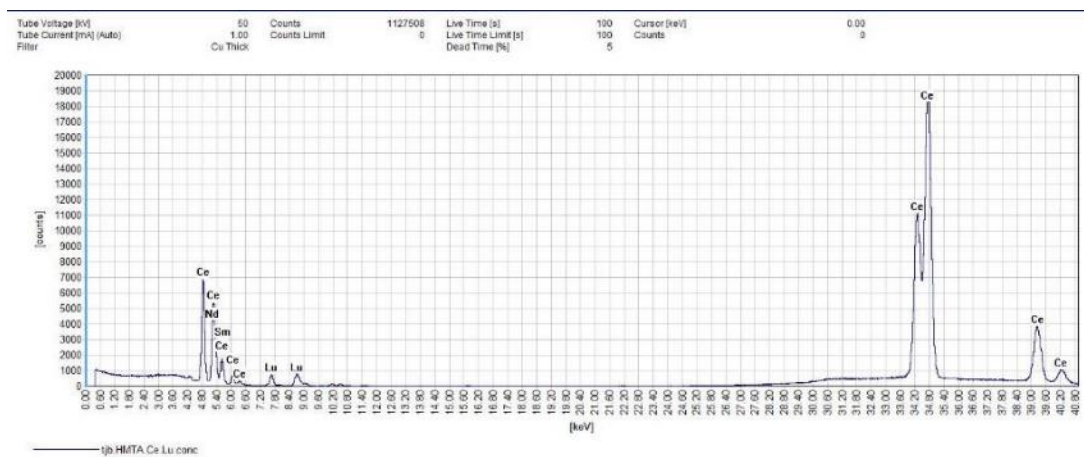


Figure S4. Analytical data for generated Er:CeO_x (a) XRF [(i) ON, (ii) HMTA, (iii) TBA], (b) pXRD RT [(i) ON, (ii) HMTA, (iii) TBA], (b*) pXRD 600°C [(i) ON, (ii) HMTA, (iii) TBA], (c) FTIR [(i) ON, (ii) HMTA, (iii) TBA], (d) DLS [(i) ON, (ii) HMTA, (iii) TBA].

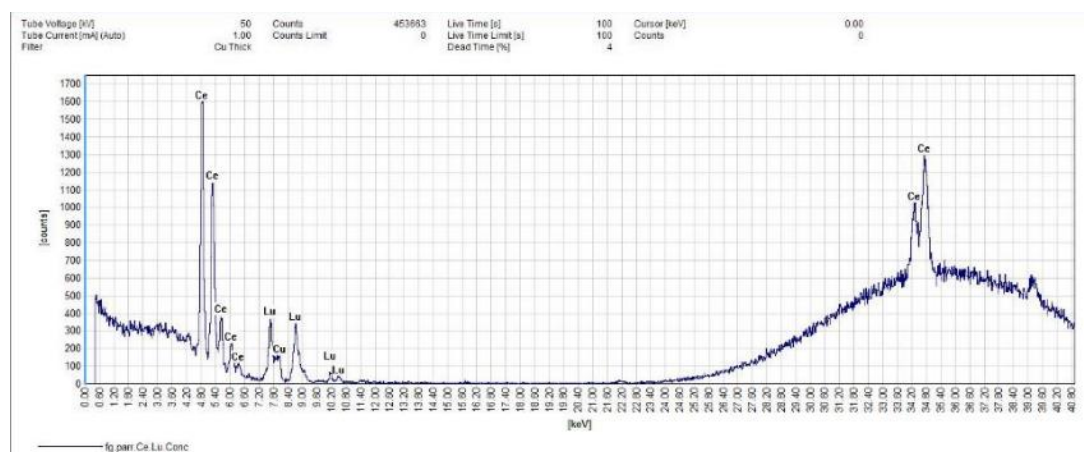
a i)



a ii)

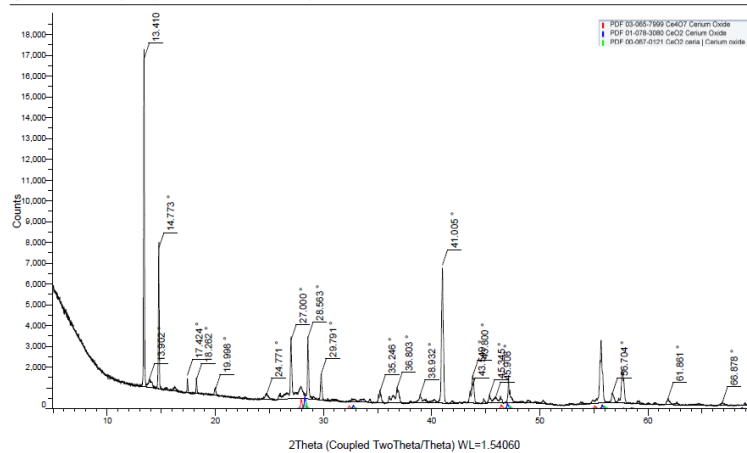


a iii)

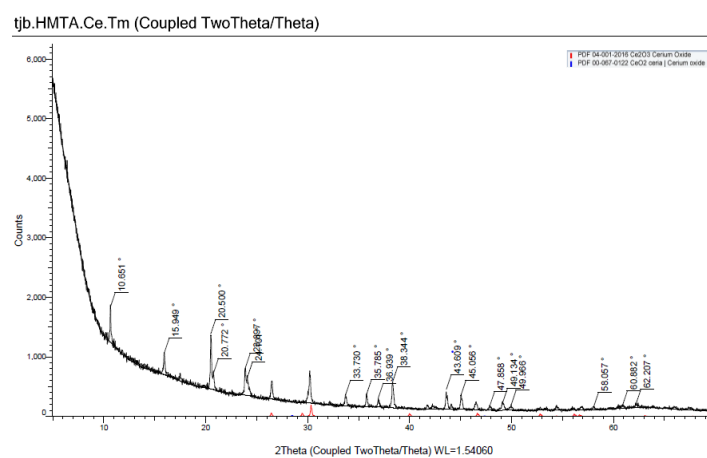


b i)

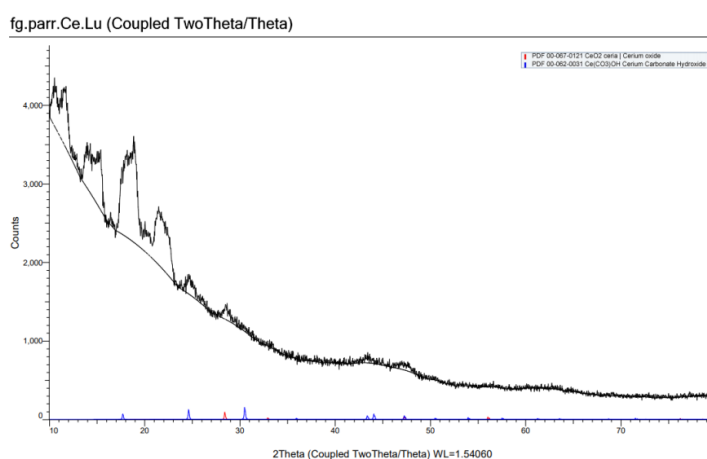
tjb.ON.Ce.Tm (Coupled TwoTheta/Theta)



b ii)

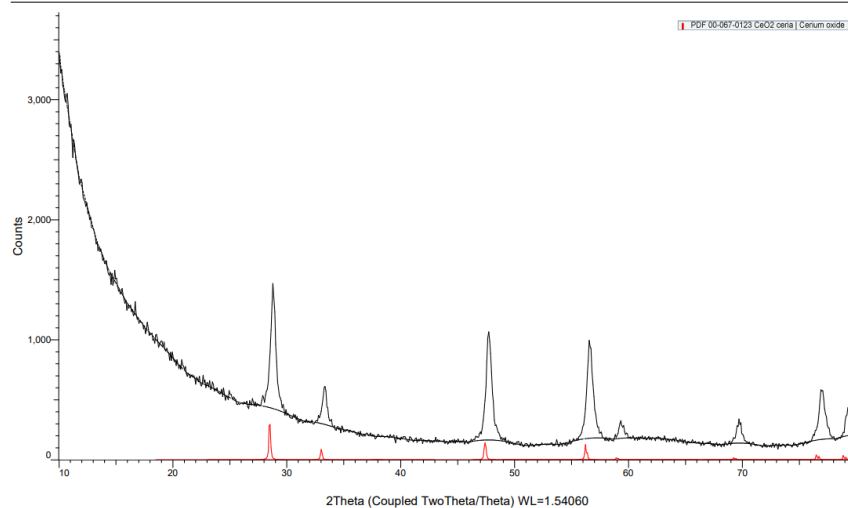


b iii)

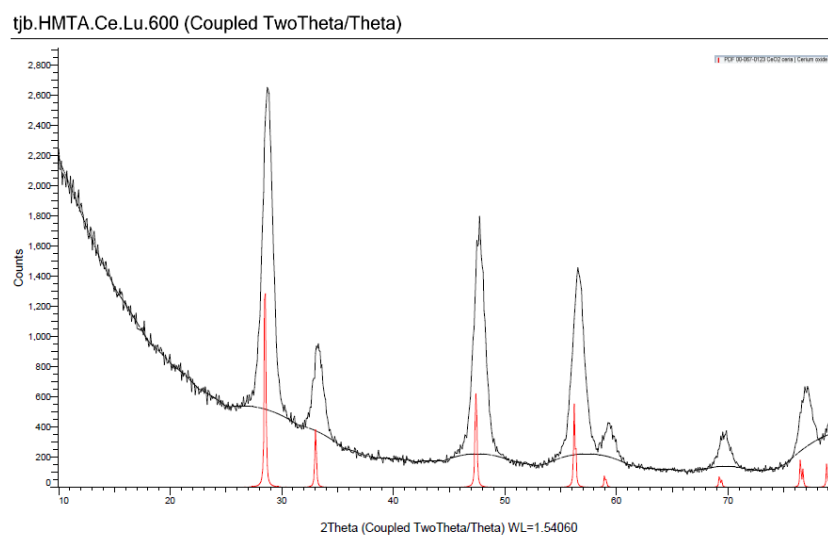


b* i)

tjb.ON.Ce.Lu.600 (Coupled TwoTheta/Theta)

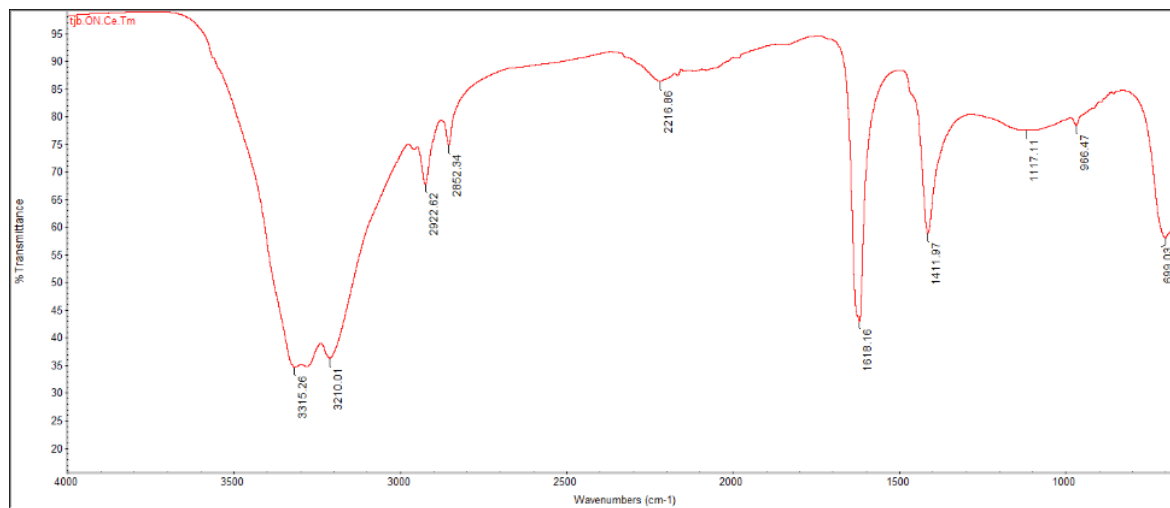


b* ii)

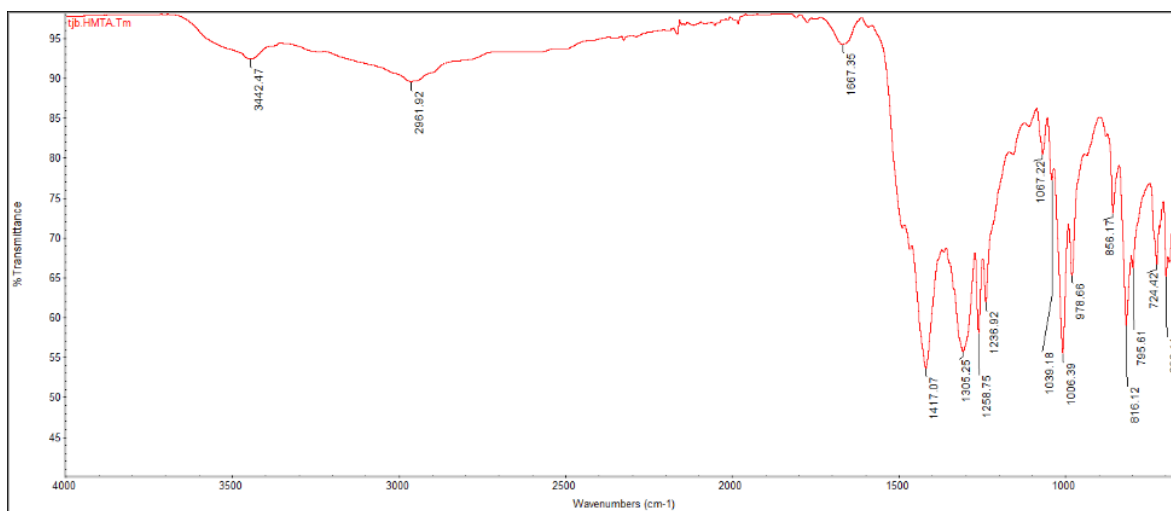


b* iii) too little material

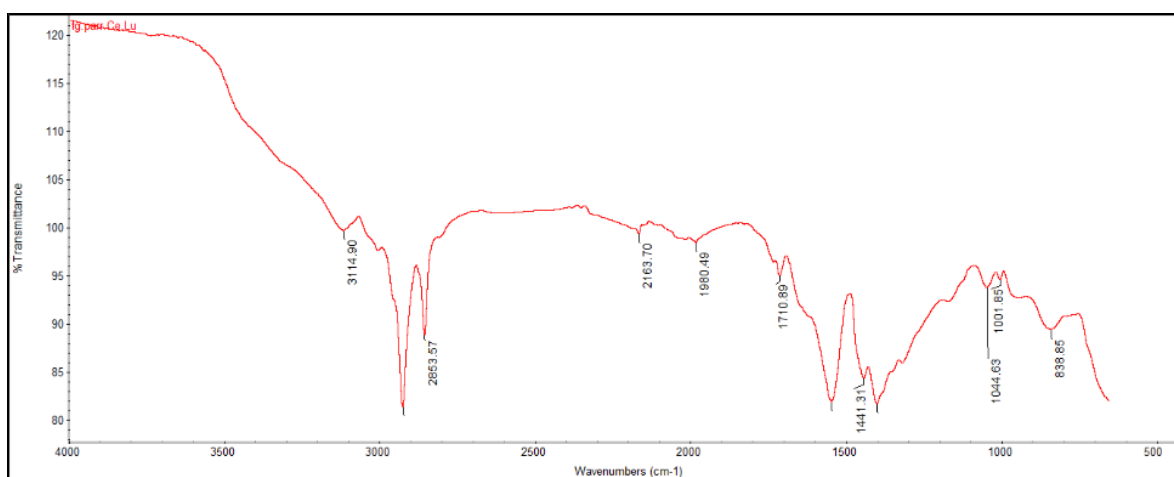
c i)



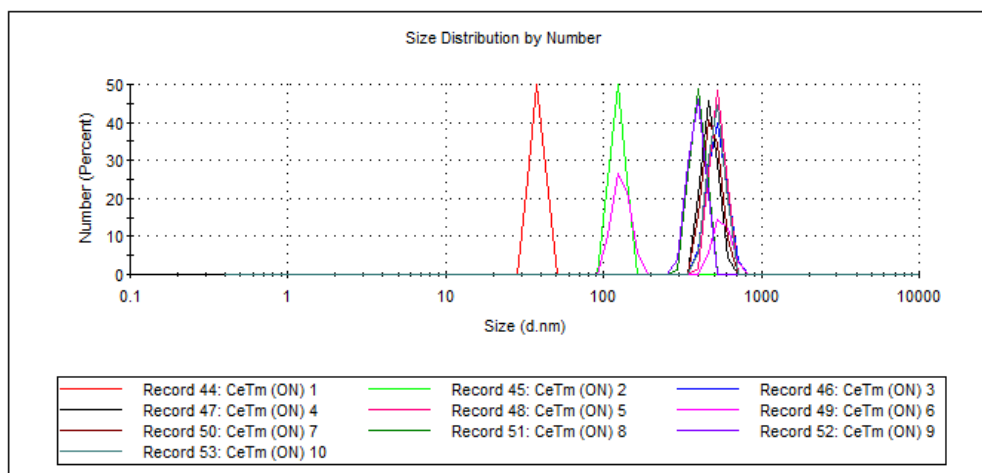
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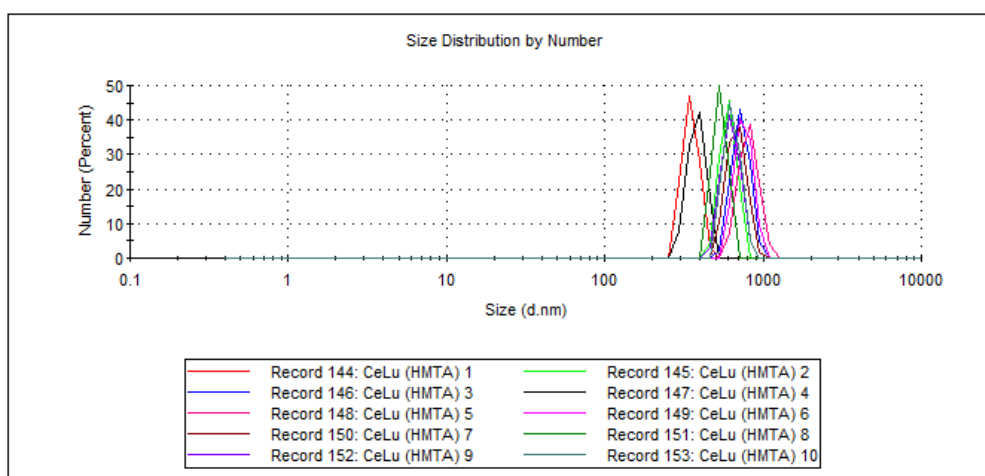
c iii)



d i)



d ii)



d iii)

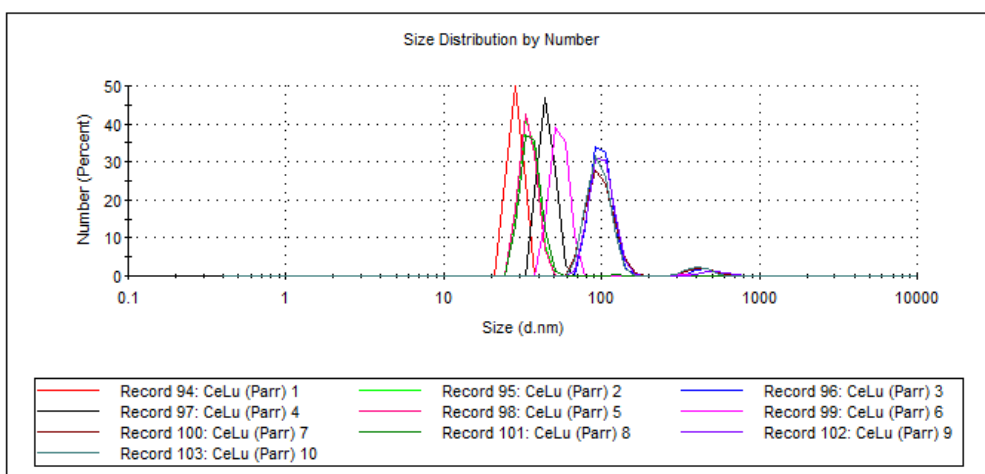


Figure S5. Analytical data for generated Lu:CeO_x (a) XRF [(i) ON, (ii) HMTA, (iii) TBA], (b) pXRD RT [(i) ON, (ii) HMTA, (iii) TBA], (b*) pXRD 600°C [(i) ON, (ii) HMTA, (iii) TBA], (c) FTIR [(i) ON, (ii) HMTA, (iii) TBA], (d) DLS [(i) ON, (ii) HMTA, (iii) TBA].