Supporting Information

Crystal structure, phase transition and thermal expansion property of NaZr$_2$(PO$_4$)$_3$-SrZr$_4$(PO$_4$)$_6$ solid solutions

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Figure S1. Difference Rietveld plot of Na$_{2+2x}$Sr$_x$Zr$_4$(PO$_4$)$_6$, a. $x = 0$, b. $x = 0.25$, c. $x = 0.3$, d. $x = 0.35$, e. $x = 0.5$, f. $x = 0.75$, g. $x = 1$. 
Figure S2. Temperature dependent XRD patterns of Na$_{(2-2x)}$Sr$_x$Zr$_4$(PO$_4$)$_6$, a. $x = 0.5$, b. $x = 0.75$. 
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|x = 0.75|
| Sr1 | 0    | 0          | 0            | 3.0 (2)    | 0.645 (8) | 1 |
| Na1 | 0    | 0          | 0            | 3.0 (2)    | 0.355 (8) | 1 |
| Na2 | 0    | 0          | 0.5          | 4 (2)      | 0.355 (7) | 1 |
| Zr1 | 0    | 0          | 0.14906 (9)  | 0.56 (7)   | 1       |   |
| Zr2 | 0    | 0          | 0.6447 (1)   | 1.13 (7)   | 1       |   |
| P1  | 0.2926 (5) | 0.0071 (7) | 0.2522 (2)   | 1.11 (7)   | 1       |   |
| O1  | 0.185 (1) | -0.003 (1) | 0.1973 (4)   | 0.87 (9)   | 1       |   |
| O2  | 0.054 (1) | -0.164 (1) | 0.6975 (3)   | 0.87 (9)   | 1       |   |
| O3  | 0.1791 (9) | 0.1718 (9) | 0.0869 (3)   | 0.87 (9)   | 1       |   |
| O4  | -0.169 (1) | -0.2155 (9) | 0.5961 (4)   | 0.87 (9)   | 1       |   |

|x = 1|
| Sr1 | 0    | 0          | 0            | 3.16 (6)   | 1       |   |
| Zr1 | 0    | 0          | 0.14949 (5)  | 0.57 (4)   | 1       |   |
| Zr2 | 0    | 0          | 0.64503 (5)  | 0.58 (4)   | 1       |   |
| P1  | 0.2909 (3) | 0.0071 (4) | 0.2514 (2)   | 0.87 (5)   | 1       |   |
| O1  | 0.1914 (6) | -0.0089 (6) | 0.1963 (3)   | 0.94 (6)   | 1       |   |
| O2  | 0.0563 (7) | -0.1530 (6) | 0.6982 (2)   | 0.94 (6)   | 1       |   |
| O3  | 0.1816 (6) | 0.1785 (6)  | 0.0884 (2)   | 0.94 (6)   | 1       |   |
| O4  | -0.1600 (7) | -0.2133 (6) | 0.5967 (2)   | 0.94 (6)   | 1       |   |
Table 2S. Main bond lengths (Å) of Na$_{2-2x}$Sr$_x$Zr$_4$(PO$_4$)$_6$

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Symmetry code for $x = 0, 0.25, 0.3$: (i) $-x+2/3, -y+1/3, -z+1/3$.

Symmetry code for $x = 0.35, 0.5, 0.75, 1$: (i) $x-y, x, -z+1$; (ii) $-x+2/3, -y+1/3, -z+1/3$; (iii) $-x+y+1/3, -x-1/3, z-1/3$. 