

## SUPPORTING INFORMATION

### Homologous Series of Rare-Earth Zinc Arsenides $REZn_{2-x}As_2 \cdot n(REAs)$ ( $RE =$ **La–Nd, Sm; $n = 3, 4, 5, 6$ )**

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**Table S1.** EDX Analyses of  $REZn_{2-x}As_2 \cdot n(REAs)$  ( $RE =$  La–Nd, Sm;  $n = 3, 4, 5, 6$ ) Crystals

**Figure S1.** Powder XRD patterns for  $RE_4Zn_{2-x}As_5$  ( $RE =$  La–Nd, Sm).

**Figure S2.** Powder XRD patterns for  $RE_5Zn_{2-x}As_6$  ( $RE =$  Ce, Pr, Nd, Sm).

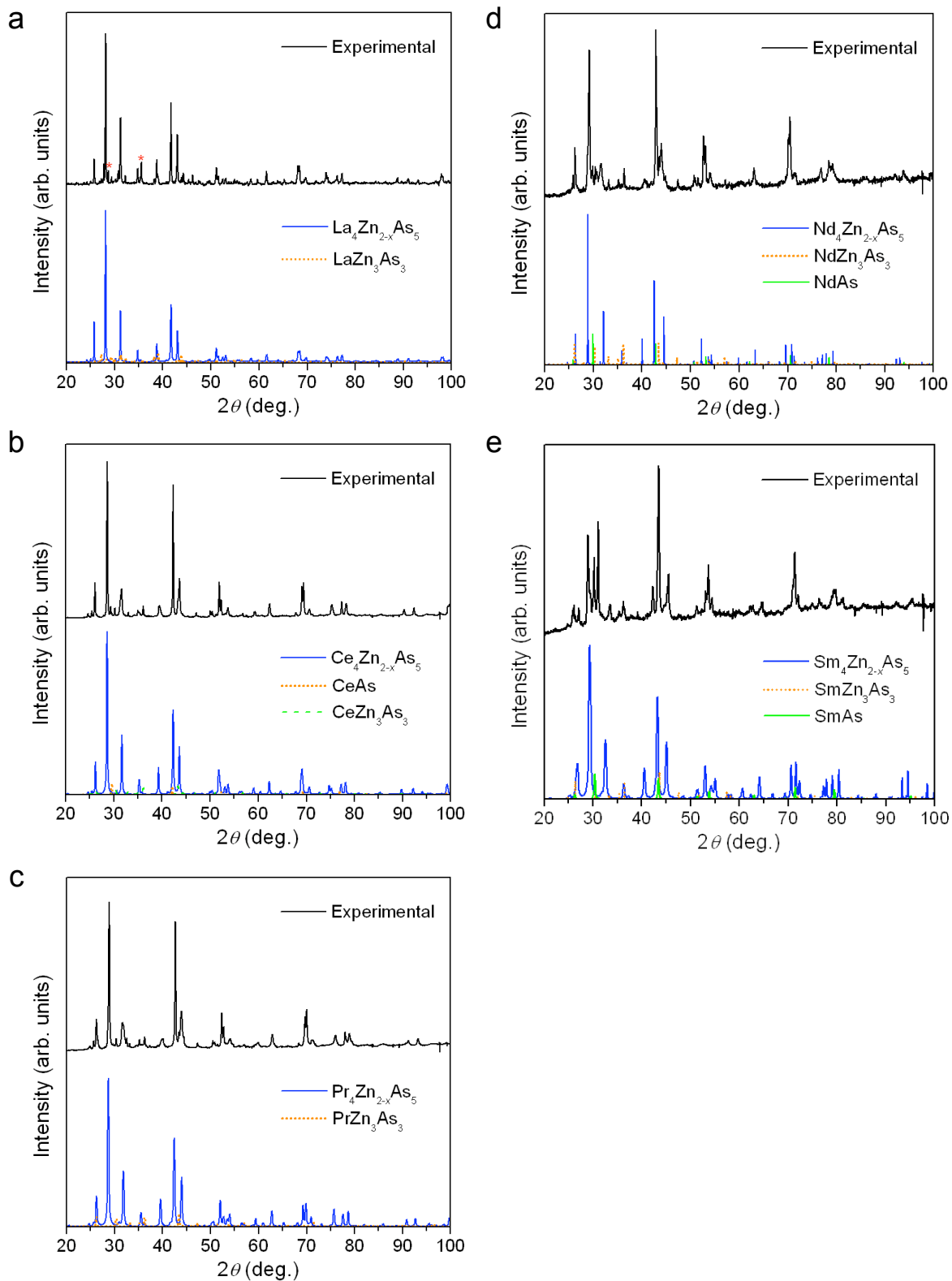
**Figure S3.** Powder XRD patterns for  $RE_6Zn_{2-x}As_7$  ( $RE =$  Ce, Pr, Nd, Sm).

**Figure S4.** Powder XRD patterns for  $RE_7Zn_{2-x}As_8$  ( $RE =$  Ce, Pr, Nd, Sm).

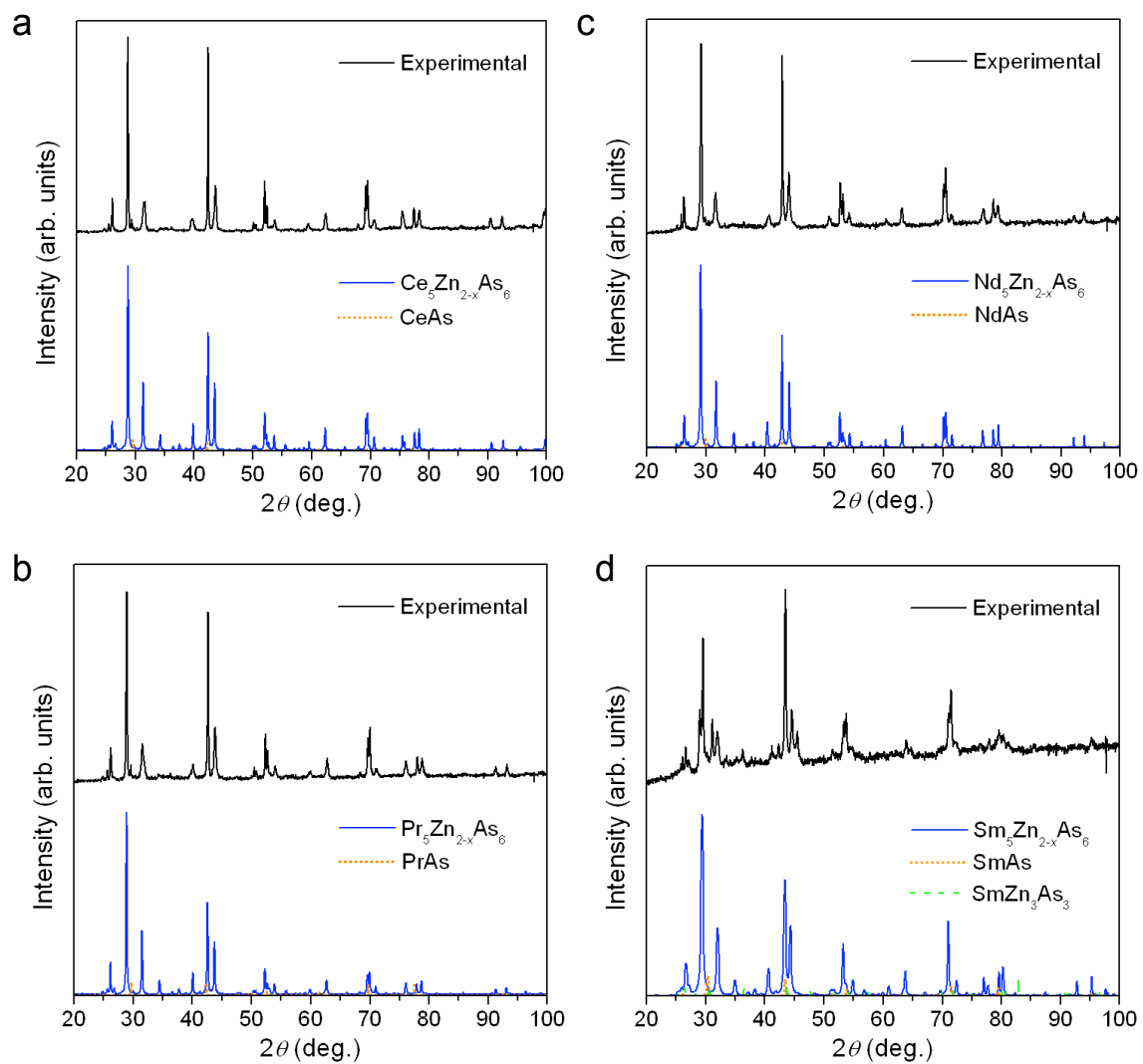
**Table S1.** EDX Analyses of  $REZn_{2-x}As_2 \cdot n(REAs)$  ( $RE = La-Nd, Sm; n = 3, 4, 5, 6$ ) Crystals <sup>a</sup>

compound	no. of analyses	at. % <i>RE</i>	at. % Mn	at. % Zn	at. % As
$La_4Zn_{1.7}As_5$	22	44(3)		12(1)	44(3)
		<i>37</i>		<i>16</i>	<i>47</i>
$Ce_4Mn_{0.4}Zn_{1.2}As_5$	8	38(1)	6(1)	11(1)	45(1)
		<i>37</i>	<i>6</i>	<i>11</i>	<i>46</i>
$Pr_4Zn_{1.7}As_5$	12	43(1)		13(1)	44(1)
		<i>37</i>		<i>16</i>	<i>47</i>
$Pr_4Zn_{1.8}As_5$	13	39(1)		16(1)	44(1)
		<i>37</i>		<i>17</i>	<i>46</i>
$Pr_5Zn_{1.7}As_6$	12	40(3)		14(2)	46(3)
		<i>39</i>		<i>14</i>	<i>47</i>
$Ce_6Mn_{0.4}Zn_{1.3}As_7$	17	44(1)	2(1)	9(1)	45(1)
		<i>41</i>	<i>3</i>	<i>9</i>	<i>48</i>
$Nd_6Zn_{1.7}As_7$	16	42(1)		11(1)	46(1)
		<i>41</i>		<i>11</i>	<i>48</i>
$Pr_7Zn_{1.8}As_8$	16	43(1)		10(1)	47(1)
		<i>42</i>		<i>10</i>	<i>48</i>

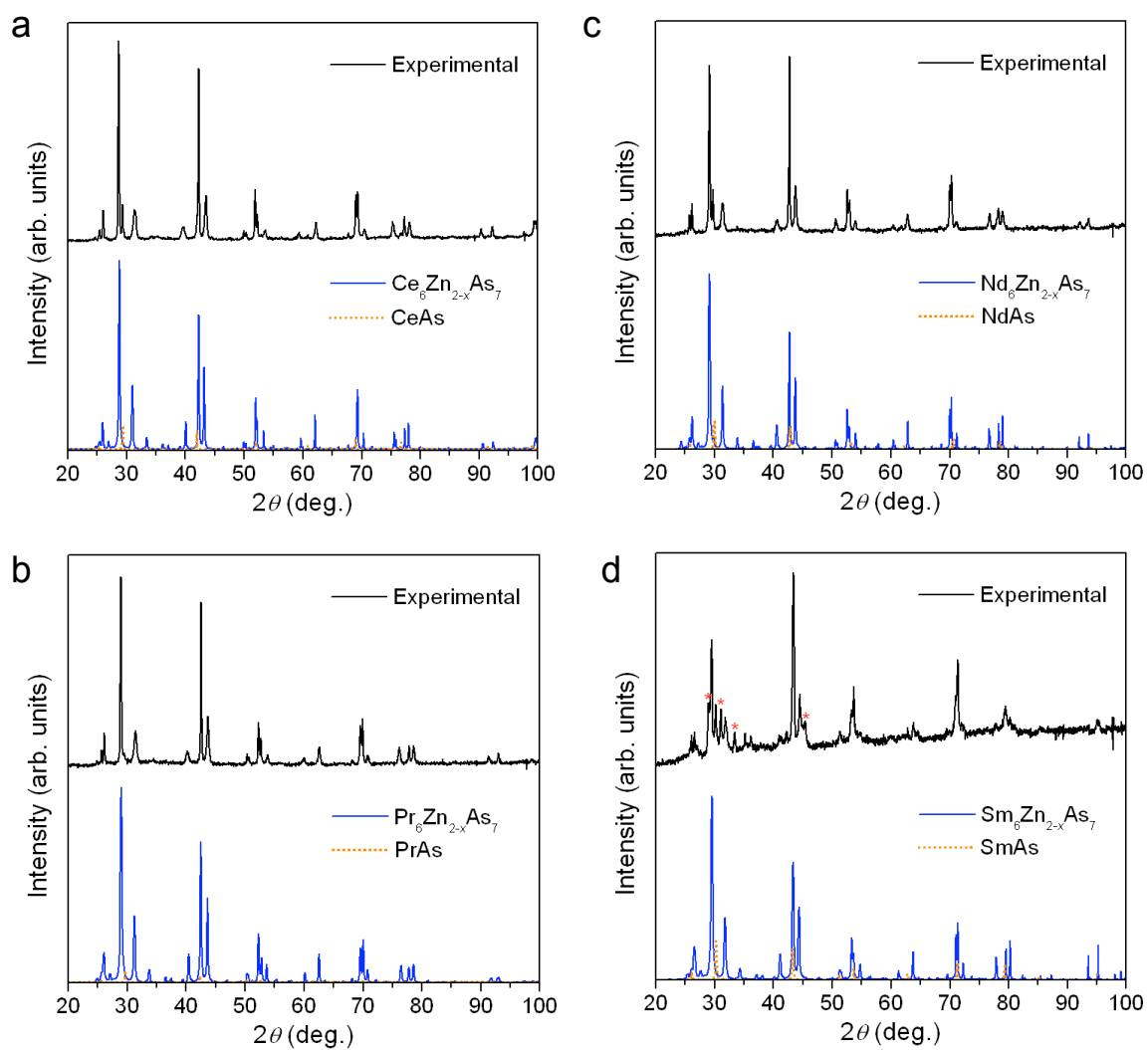
<sup>a</sup> Expected compositions are indicated in italics.



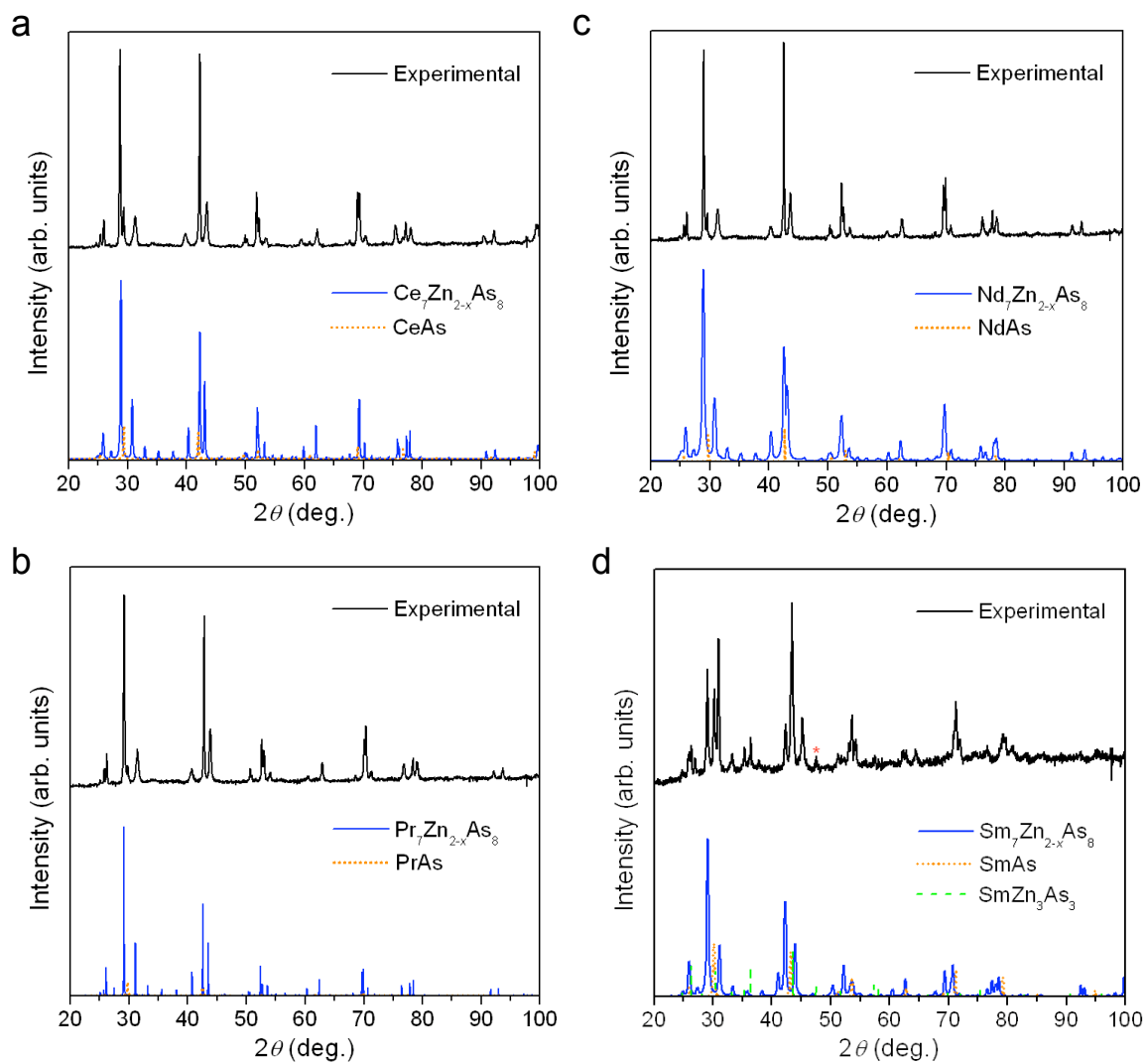
**Figure S1.** Powder XRD patterns for  $RE_4Zn_{2-x}As_5$  ( $RE = La-Nd, Sm$ ).



**Figure S2.** Powder XRD patterns for  $RE_5Zn_{2-x}As_6$  ( $RE = Ce, Pr, Nd, Sm$ ).



**Figure S3.** Powder XRD patterns for  $RE_6Zn_{2-x}As_7$  ( $RE = Ce, Pr, Nd, Sm$ ).



**Figure S4.** Powder XRD patterns for  $RE_7Zn_{2-x}As_8$  ( $RE = Ce, Pr, Nd, Sm$ ).