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Correction to: Valencies of the lanthanides

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Correction to: Found Chem (2018) 20:15–27
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The authors regret that there are errors in equation (6) and subsequent discussion. The correct version is as follows:

$$i = L\left[-\overline{E}_f + \left(\Delta_i p\right)\overline{E}_p - \left(\Delta_i q\right)\overline{E}_q + \left(\Delta_i c_3\right)\overline{E}^3\right] + (5/2)RT \tag{6}$$

The values of $\Delta_i p, - \Delta_i q$, and $\Delta_i c_3$ are given in Table 4. The second of these determines the loss of exchange energy and peaks at f^7.

As with the tetrad effect, the irregularities in $\Delta_i c_3$ centred on the quarter- and the three-quarter full shell are associated with the ability of electrons to keep apart better if their m_l values have the same sign rather than opposite. This eases the general increase in interelectronic repulsion in the first quarter of the series, where electrons have m_l values of the same sign, relative to the second quarter, where they have both positive and negative values (Table 2). On ionization, this easement is lost in the first quarter and gained in the second (Table 4); similarly in the third quarter over the fourth quarter.

Errors have subsequently been identified in the original publication. Table 5 was incorrectly published and the corrected table is given below:

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Table 4 Values of the coefficients in Eq. (6)

Process	$\Delta_i p$	$-\Delta_i q$	$\Delta_i c_3$
$f^1 \rightarrow f^0$	0	0	0
$f^2 \rightarrow f^1$	-1	1	$+9$
$f^3 \rightarrow f^2$	-2	2	$+12$
$f^4 \rightarrow f^3$	-3	3	0
$f^5 \rightarrow f^4$	-4	4	-12
$f^6 \rightarrow f^5$	-5	5	-9
$f^7 \rightarrow f^6$	-6	6	0
$f^8 \rightarrow f^7$	-7	0	0
$f^9 \rightarrow f^8$	-8	1	$+9$
$f^{10} \rightarrow f^9$	-9	2	$+12$
$f^{11} \rightarrow f^{10}$	-10	3	0
$f^{12} \rightarrow f^{11}$	-11	4	-12
$f^{13} \rightarrow f^{12}$	-12	5	-9
$f^{14} \rightarrow f^{13}$	-13	6	0

Table 5 Nature of apparently bivalent compounds

	La	Ce	Pr	Nd	Pm[a]	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb
LnI_2	M	M	M	S	S	S	S	M	—[b]	S	—[b]	—[b]	S	S
LnTe	M	M	M	M	M	S	S	M	M	M	M	M	S	S
LnSe	M	M	M	M	M	S	S	M	M	M	M	M	X	S
LnS	M	M	M	M	M	S	S	M	M	M	M	M	M	S
LnH_2	M	M	M	M	M	M	S	M	M	M	M	M	M	S
LnC_2	M	M	M	M	M	M	S	M	M	M	M	M	M	X

At room temperature and pressure

S salt-like, *M* metallic, *X* mixed

[a]Predicted (from Fig. 6)

[b]Attempts to prepare LnI_2 by the reaction of Ln with LnI_3, which were successful at dysprosium, were unsuccessful in these cases (Johnson and Corbett 1970)