Erratum: Structure, branching ratios, and a laser-cooling scheme for the ^{138}BaF molecule **[Phys. Rev. A **94**, 063415 (2016)]**

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(Received 16 July 2019; published 12 August 2019)

 DOI: [10.1103/PhysRevA.100.029901](https://doi.org/10.1103/PhysRevA.100.029901)

There are two errors in the main text. One is typographical mistakes in Table VI on the superposition of pure J states, and another is on the calculated mixed g factors for the $|X, N = 1, -\rangle$ state in Table IX. Since both mistakes lead to significantly different results that are important to the concerned readers, we modify them as following.

First, the J -mixing coefficients in $N = 1$ and $N = 2$ rotational states are corrected in Table VI. Since the branching ratios are related to such J -mixing phenomena, we update the resulting branching ratios for $N = 1$ and $N = 2$, respectively, in Tables VII and VIII. Second, for calculation on the Zeeman splittings of the $|X, N = 1, -\rangle$ state, Eq. (12) should be corrected as

$$\begin{aligned} \langle \phi | g_S \mu_B T_{p=0}^1(\hat{S}) | \phi' \rangle &= g_S \mu_B (-1)^{F-m_F} \begin{pmatrix} F & 1 & F' \\ -m_F & 0 & m'_F \end{pmatrix} (-1)^{F'+J+1+I} [F']^{1/2} [F]^{1/2} (-1)^{J+N+1+S} [J']^{1/2} [J]^{1/2} \\ &\times \{S\}^{1/2} \begin{Bmatrix} F & J & I \\ J' & F' & 1 \end{Bmatrix} \begin{Bmatrix} J & S & N \\ S & J' & 1 \end{Bmatrix}, \end{aligned} \quad (12)$$

and the corresponding mixed g factors for each hyperfine sublevels are listed in Table IX.

TABLE VI. The J -mixing phenomena in $N = 1$ and $N = 2$ rotational states of the ground X state. The corresponding coefficients are $\alpha_1 = 0.9593$, $\beta_1 = 0.2824$ and $\alpha_2 = 0.9858$, $\beta_2 = 0.1679$.

N	Mixed label	Superposition of pure J states
1	$ J = 1/2, F = 0\rangle$	$ J = 1/2(F = 0)\rangle$
	$ J = 1/2, F = 1\rangle$	$\alpha_1 J = 1/2(F = 1)\rangle - \beta_1 J = 3/2(F = 1)\rangle$
	$ J = 3/2, F = 1\rangle$	$\beta_1 J = 1/2(F = 1)\rangle + \alpha_1 J = 3/2(F = 1)\rangle$
	$ J = 3/2, F = 2\rangle$	$ J = 3/2(F = 2)\rangle$
2	$ J = 3/2, F = 1\rangle$	$ J = 3/2(F = 1)\rangle$
	$ J = 3/2, F = 2\rangle$	$\alpha_2 J = 3/2(F = 2)\rangle - \beta_2 J = 5/2(F = 2)\rangle$
	$ J = 5/2, F = 2\rangle$	$\beta_2 J = 3/2(F = 2)\rangle + \alpha_2 J = 5/2(F = 2)\rangle$
	$ J = 5/2, F = 3\rangle$	$ J = 5/2(F = 3)\rangle$

TABLE VII. Calculated hyperfine branching ratios for decays from the $|A, J' = 1/2, +\rangle$ state to the $|X, N = 1, -\rangle$ state.

J	F	m_F	$F' = 0$ $m'_F = 0$	$m'_F = -1$	$F' = 1$ $m'_F = 0$	$m'_F = 1$
1/2	0	0	0	2/9	2/9	2/9
		-1	0.1282	0.2493	0.2493	0
1/2	1	0	0.1282	0.2493	0	0.2493
		1	0.1282	0	0.2493	0.2493
		-1	0.2051	0.0007	0.0007	0
3/2	1	0	0.2051	0.0007	0	0.0007
		1	0.2051	0	0.0007	0.0007
		-2	0	1/6	0	0
		-1	0	1/12	1/12	0
3/2	2	0	0	1/36	1/9	1/36
		1	0	0	1/12	1/12
		2	0	0	0	1/6

TABLE VIII. Calculated hyperfine branching ratios for decays from the $|A, J' = 1/2, -\rangle$ state to the $|X, N = 0, 2, +\rangle$ state.

N	J	F	m_F	$F' = 0$ $m'_F = 0$	$m'_F = -1$	$F' = 1$ $m'_F = 0$	$m'_F = 1$
0	1/2	0	0	0	2/9	2/9	2/9
			-1	2/9	2/9	2/9	0
		1	0	2/9	2/9	0	2/9
			1	2/9	0	2/9	2/9
			-1	1/9	1/36	1/36	0
2	3/2	1	0	1/9	1/36	0	1/36
			1	1/9	0	1/36	1/36
			-2	0	0.1620	0	0
			-1	0	0.0810	0.0810	0
	3/2	2	0	0	0.0270	0.1080	0.0270
			1	0	0	0.0810	0.0810
			2	0	0	0	0.1620
			-2	0	0.0047	0	0
			-1	0	0.0023	0.0023	0
	5/2	2	0	0	0.0008	0.0031	0.0008
			1	0	0	0.0023	0.0023
			2	0	0	0	0.0047

TABLE IX. The typical g factors (g_F) and the mixed ones for the four hyperfine levels in the $|X, N = 1, -\rangle$ state.

State label	Typical g -factor g_F	Mixed g factor
$ J = 1/2, F = 0\rangle$	0.00	0.00
$ J = 1/2, F = 1\rangle$	-0.33	-0.51
$ J = 3/2, F = 1\rangle$	0.83	1.01
$ J = 3/2, F = 2\rangle$	0.50	0.50