

## MEP 2005

### MERCURY ( $\lambda \approx 282$ nm)

Absorbing ion  $^{199}\text{Hg}^+$ ,  $5d^{10}6s^2S_{1/2}$  ( $F = 0$ ) –  $5d^96s^2D_{5/2}$  ( $F = 2$ )  $\Delta m_F = 0$  transition

#### 1. CIPM recommended values

The values  $f = 1\,064\,721\,609\,899\,145$  Hz

$\lambda = 281\,568\,867.591\,968\,6$  fm

with a relative standard uncertainty of  $3 \times 10^{-15}$ , apply to the unperturbed quadrupole transition of a trapped and cooled mercury ion.

#### 2. Source data

Adopted value :  $f = 1\,064\,721\,609\,899\,145$  (3) Hz  $u_c/y = 3 \times 10^{-15}$

for which:

$\lambda = 281\,568\,867.591\,968\,6$  (8) fm  $u_c/y = 3 \times 10^{-15}$

calculated from

$f$ / Hz	$u_c/y$	source data
1 064 721 609 899 144.94	$1 \times 10^{-15}$	[1]

In view of there is only being one laboratory's measurement of this transition, the CCL considered it prudent to round the NIST value to the nearest Hz, and adopt an uncertainty of three times the quoted .97 Hz NIST uncertainty and rounded to 3 Hz or  $3 \times 10^{-15}$ .

#### 3. References

[1] Oskay W. H., Diddams S. A., Donlay E. A., Fortier T. M., Heavner T. P., Hollberg L., Itano W. M., Jefferts S. R., Delaney M. J., Kim K., Levi F., Parker T. E., Bergquist J. C., Single-Atom Optical Clock with High Accuracy, *Phys. Rev. Lett.*, **97**, 020801/1-4, 2006.