The isotope package*

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1 Introduction

Despite its powerful typographic capabilities it is surprisingly difficult to typeset isotopes with LaTeX. Ad hoc methods as for example `$^{232}_{90}\mathrm{Th}$` give poor results as $^{232}_{90}\mathrm{Th}$. This is not satisfactory because of the wrong alignment of atomic and nuclear numbers. The package isotope provides the `\isotope` macro for correct typesetting of isotopes.

2 Usage

The package isotope has to be included into the preamble of your LaTeX file by:

```
\usepackage{isotope}
```

`\isotope` The usage of the `\isotope` macro is straight forward. Just provide the isotope's name and optionally its nucleon number and its atomic number.

`\isotope[`⟨*nucleon number*⟩`][`⟨*atomic number*⟩`]{`⟨*name*⟩`}`

See Table **??** for some examples. Note that the `\alpha` has been enclosed by `\mathnormal`. Not doing so may give unexpected results for some math fonds.

`\isotopestyle` The macro `\isotopestyle` determines the style which is used to typeset the name of the iostope. It may be redefined. For example, the redefinition

```
\renewcommand{\isotopestyle}{\mathsf}
\isotope[228]{Ra}
```

gives $^{228}\mathsf{Ra}$.

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Table 1: Examples for \isotope macro usage.

command	result
`\isotope{Ra}`	$\isotope{Ra}$
`\isotope[228]{Ra}`	$\isotope[228]{Ra}$
`\isotope[228][88]{Ra}`	$\isotope[228][88]{Ra}$
`$\isotope[A][Z]{X}\to\isotope[A-4][Z-2]{Y}+ \isotope[4][2]{\mathnormal{\alpha}}$`	$\isotope[A][Z]{X}\to\isotope[A-4][Z-2]{Y}+ \isotope[4][2]{\mathnormal{\alpha}}$

3 Implementation

`\isotopestyle` `\isotopestyle` determines the style which is used to typeset the name of an iostope and its nucleon and atomic numbers.

```
\newcommand{\isotopestyle}{\mathrm}
```

`\isotope` Now it follows the implementation of the `\isotope` macro.

```
\newcommand{\isotope@atomicnumber}{}
\newcommand{\isotope@nucleonnumber}{}
\newcommand{\isotope}[1][]{%
  \begingroup%
  \renewcommand{\isotope@nucleonnumber}{#1}%
  \isotope@two}%
  \newcommand{\isotope@two}[2][]{%
  \renewcommand{\isotope@atomicnumber}{#1}%
  {\m@th%
```

Determine which has a larger width nucleon number or atomic number.

```
  \settowidth\@tempdimb{\ensuremath{%
    \scriptstyle\isotope@nucleonnumber}}%
  \settowidth\@tempdimc{\ensuremath{%
    \scriptstyle\isotope@atomicnumber}}%
  \ifdim\@tempdimb<\@tempdimc\@tempdimb=\@tempdimc\fi%
  \ensuremath{{}%
    ^{\makebox[\@tempdimb][r]{\ensuremath{%
       \scriptstyle\isotope@nucleonnumber}}}%
    _{\makebox[\@tempdimb][r]{\ensuremath{%
       \scriptstyle\isotope@atomicnumber}}}%
    \isotopestyle{#2}}%
  }%
  \endgroup%
}%
```