

The magref package*

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1 Introduction

This document describes the **magref** package, a collection of macros to facilitate the writing of papers and reports on magnetic refrigeration. It just defines common macros and loads packages that are normally used:

- engsymbols
- sinuitx
- mhchem
- ifthen

Please notice that the user should refer to other references such as papers and textbooks to get the meaning of the symbols I describe here.

2 Implementation

The use of the conditional commands to define these custom macro is because some packages and classes that I use in conjunction with **magref** provide some obscure commands that clash with them. A normal user should not have any problems with that.

2.1 Specific heats

```
1 \newcommand{\cpo}{c_{p,0}}  
2 \newcommand{\cvo}{c_{v,0}}
```

2.2 Common refrigeration parameters

```
3 \newcommand{\qe}{\rate{Q}\ped{e}}  
4 \newcommand{\dtspan}{\Delta{T}\ped{span}}
```

*This document corresponds to **magref** v0.2?, dated 2016/03/21.

```

5 \newcommand{\wpump}{\rate{W}\ped{p}}
6 \newcommand{\wmag}{\rate{W}\ped{m}}
7 \newcommand{\cop}{\mathrm{COP}}
8 \newcommand{\dtad}{\Delta{T}\ped{ad}}
9 \newcommand{\dsm}{\Delta{s}\ped{m}}
10 \newcommand{\tc}{T\ped{C}}
11 \ifthenelse{\isundefined{\th}}{\newcommand{\th}{T\ped{H}}}{\renewcommand{\th}{T\ped{H}}}
12 \newcommand{\qc}{\rate{Q}\ped{C}}
13 \newcommand{\qh}{\rate{Q}\ped{H}}
14 \newcommand{\ths}{T\ped{H,s}}
15 \newcommand{\tcs}{T\ped{C,s}}
16 \newcommand{\w}{\rate{W}}
17 \newcommand{\lcool}{\Lambda\ped{cool}}

```

2.3 Common vector fields

```

18 \newcommand{\rvec}{\nvector{r}}
19 \newcommand{\nvh}{\nvector{H}}
20 \newcommand{\nvb}{\nvector{B}}
21 \newcommand{\nvrem}{\nvector{B}\ped{rem}}
22 \newcommand{\nvbrem}{\nvrem}
23 \newcommand{\nvm}{\nvector{M}}
24 \newcommand{\nvdip}{\nvector{m}}
25 \newcommand{\nvnetdip}{\nvector{\mathcal{M}}}
26 \newcommand{\nvbremhat}{\hat{\nvector{B}}\ped{rem}}
27 \newcommand{\nvbi}{\nvector{B}_k}
28 \newcommand{\nvhi}{\nvector{H}_k}
29 \newcommand{\nvremi}{\nvector{B}_{\mathrm{rem},k}}
30 \newcommand{\nvai}{\nvector{A}_k}

```

2.4 Common other scalar parameters

```

31 \newcommand{\mur}{\mu\ped{r}}
32 \newcommand{\bl}{B\ped{l}}
33 \newcommand{\bh}{B\ped{h}}
34 \newcommand{\brem}{B\ped{rem}}
35 \newcommand{\muri}{\mu_{\mathrm{r},k}}
36 \newcommand{\bremai}{B_{\mathrm{rem},k}}

```

2.5 Geometric parameters

```

37 \newcommand{\ri}{R\ped{i}}
38 \ifthenelse{\isundefined{\ro}}{\newcommand{\ro}{R\ped{o}}}{\renewcommand{\ro}{R\ped{o}}}
39 \newcommand{\rg}{R\ped{g}}
40 \newcommand{\rs}{R\ped{s}}
41 \newcommand{\rc}{R\ped{c}}
42 \newcommand{\re}{R\ped{e}}
43 \newcommand{\hgap}{h\ped{gap}}

```

2.6 Coefficients for the analytical solution

```

44 \newcommand{\acoef}[2]{a_{\{#1\},\mathrm{#2}}}
45 \newcommand{\bcoef}[2]{b_{\{#1\},\mathrm{#2}}}

```

```

46 \newcommand{\Azexpr}[1]{A_{\mathrm{#1}\,,z}}
47 \newcommand{\bremii}{B_{\mathrm{rem,II}}}
48 \newcommand{\bremiv}{B_{\mathrm{rem,IV}}}
49 \newcommand{\murn}[1]{\mu\mathrm{ped}{r,#1}}
50 \newcommand{\aIII}{\mathrm{acoef}{1}{III}}
51 \newcommand{\bIII}{\mathrm{bcoef}{1}{III}}
52 \newcommand{\nvbIII}{\mathrm{nvector}{B}\mathrm{ped}{III}}
53 \newcommand{\BIII}{B\mathrm{ped}{III}}

```