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Subroutine MAP_STEEL_HETRO

0.   Provenance of Source Code

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1.   Purpose

MAP_STEEL_HETRO calculates compositions for solute depleted regions.

2.   Specification

SUBROUTINE MAP_STEEL_HETRO(C,D,M,R)

DOUBLE PRECISION C(7), D(8), M, R

3.   Description

MAP_STEEL_HETRO calculates compositions for solute depleted regions. Carbon partitioning is ignored. Thermodynamic data is taken from [1].

4.   References

1. J.S. Kirkaldy and E.A. Baganis, *Metallurgical Transactions A*, **9A**, (1978), 495-501.

5.   Parameters

Input parameters

C - real array of dimension 7
   C contains the concentrations (by weight percent) of carbon, silicon, manganese, nickel, molybdenum, chromium, and vanadium.

M - real
   M is the melting point (in kelvin). If it is assumed that solidification is as for delta ferrite, then a value of 1793.0 may be used.

R - real
   R is the universal gas constant (in joules per mole per kelvin, J mol^{-1} K^{-1}).

Output parameters

D - real array of dimension 8
   D contains the concentrations (by weight percent) of carbon, silicon, manganese, nickel, molybdenum, chromium, vanadium, and iron, in the the solute depleted regions.

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6.   Error Indicators

None

7.   Accuracy

8.   Further Comments

9.   Example

9.1 Program text

```
DOUBLE PRECISION C(7),D(8),M,R
INTEGER I
INCLUDE 'map_constants_gas.f'
READ (5,*) (C(I), I=1,7)
READ (5,*) M
CALL MAP_STEEL_HETRO(C,D,M,R)
WRITE (6,*) (D(I), I=1,8)
STOP
END
```

9.2 Program data

0.044   0.34   1.09   0.01   0.01   0.01   0.01

9.3 Program results   for 1773 K

4.4000000000000D-02	0.24222276147993	0.81429849930809	4.5530070183873D-03
4.9634466737045D-03	8.2769168861460D-03	7.6021657367488D-03	98.874083202897

10.   Auxiliary Routines

None

11.   Keywords

solute depletion

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