

ADAS Subroutine rbchid

FUNCTION RBCHID(Z,XI,ZETA,TE)

IMPLICIT REAL*8(A-H,O-Z)

C PURPOSE: EVALUATES A SHELL CONTRIBUTION TO THE IONISATION RATE
C COEFFICIENT IN THE BURGESS-CHIDICHIMO APPROXIMATION

C

C MNRAS(1983)203,1269.

C

C Z=TARGET ION CHARGE NUMBER

C XI=EFFECTIVE IONISATION POTENTIAL FOR SHELL (RYD)

C ZETA=EFFECTIVE NUMBER OF EQUIVALENT ELECTRONS IN SHELL

C TE=ELECTRON TEMPERATURE (K)

C UNIX-IDL PORT:

C WILLIAM OSBORN, TESSELLA SUPPORT SERVICES PLC.

C

C DATE: 22ND APRIL 1996

C

C VERSION: 1.1 DATE: 22-04-96

C MODIFIED: WILLIAM OSBORN

C - FIRST VERSION. NO CHANGES TO IBM CODE.

C

C VERSION: 1.2 DATE: 16-05-07

C MODIFIED: Allan Whiteford

C - Updated comments as part of subroutine documentation
C procedure.

C

C-----

RBCHID=0.0D0

C=2.3D0

BETA=0.25D0*(DSQRT((100.0D0*Z+91.0)/(4.0D0*Z+3.0D0))-5.0D0)

ATE=1.5789D5/TE

Y=ATE*XI

C WRITE(6,1001) ATE,XI,Y

C WRITE(7,1001) ATE,XI,Y

1001 FORMAT(1H0,' ATE,XI,Y = ',1P,3D12.2)

IF(Y.GT.150.0D0)GO TO 10

T1=ZETA*DSQRT(Y)*DEXP(-Y)*EEI(Y)/XI**1.5D0

P=1.0D0+1.0D0/Y

W=(DLOG(P))**(BETA/P)

RBCHID=2.1715D-8*C*T1*W

10 RETURN

END

REAL*8

TE,

XI,

Z,

ZETA