

How to Get RGP file for Nitrogen.

Problem/Description:

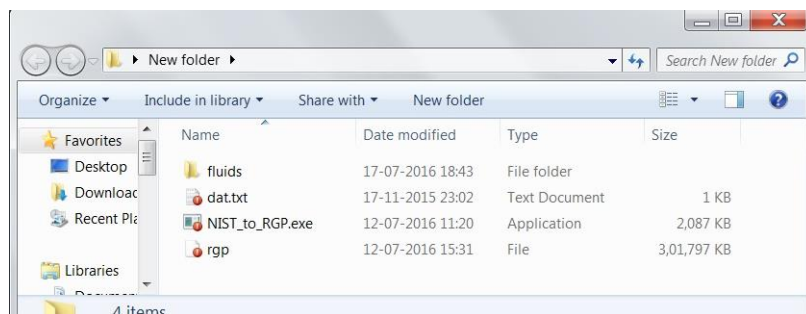
How to get RGB file for Nitrogen.

Solution:

Here I am giving details about converting NIST to RGP for Nitrogen. The procedure can be applied for other real gas materials too. Users need to have access to NIST database.

Please follow the procedure as mentioned below:

1) Unzip and copy the files “dat.txt” & “NIST_to_RGP.exe” in same folder.



2) Create a folder called “fluids” in the same directory & copy all NIST REF PROP fluid database fluids (e.g. CO₂, N₂ etc.) This folder should essentially contain all the files generated from NIST database like *.fld etc. The code will be looking for this directory and input file (dat.txt) for the selected fluid.

The folder “fluids” contains the files as given below

1BUTENE.FLD	D2O.FLD	METHANE.FLD	R14.FLD	R218.FLD
ACETONE.FLD	DECANE.FLD	METHANOL.FLD	R21.FLD	R227EA.FLD
AIR.PPF	DME.FLD	N2O.FLD	R22.FLD	R236EA.FLD
AMMONIA.FLD	ETHANE.FLD	NEON.FLD	R23.FLD	R236FA.FLD
ARGON.FLD	ETHANOL.FLD	NEOPENTN.FLD	R32.FLD	R245CA.FLD
BENZENE.FLD	ETHYLENE.FLD	NF3.FLD	R41.FLD	R245FA.FLD
BUTANE.FLD	FLUORINE.FLD	NITROGEN.FLD	R113.FLD	R365MFC.FLD
C2BUTENE.FLD	H2S.FLD	NONANE.FLD	R114.FLD	R404A.PPF
C4F10.FLD	HELIUM.FLD	OCTANE.FLD	R115.FLD	R407C.PPF
C5F12.FLD	HEPTANE.FLD	OXYGEN.FLD	R116.FLD	R410A.PPF
C12.FLD	HEXANE.FLD	PARAHYD.FLD	R123.FLD	R507A.PPF
CF3I.FLD	HMX.BNC	PENTANE.FLD	R124.FLD	RC318.FLD
CO.FLD	HYDROGEN.FLD	PROPANE.FLD	R125.FLD	SF6.FLD
CO2.FLD	IBUTENE.FLD	PROPYLEN.FLD	R134A.FLD	SO2.FLD
COS.FLD	IHEXANE.FLD	PROPYNE.FLD	R141B.FLD	T2BUTENE.FLD
CYCLOHEX.FLD	IPENTANE.FLD	R11.FLD	R142B.FLD	TOLUENE.FLD
CYCLOPRO.FLD	ISOBUTAN.FLD	R12.FLD	R143A.FLD	WATER.FLD
D2.FLD	KRYPTON.FLD	R13.FLD	R152A.FLD	XENON.FLD

3) Modify the field under IFLD in dat.txt file to generate RGP for N2. As you want an RGP file using N2.

```
dat.txt - Notepad
File Edit Format View Help
# NIST-RGP.F INPUT:
#
# IFLD=1 -> PH2
# IFLD=2 -> LOX
# IFLD=3 -> PROPANE (C3H8)
# IFLD=4 -> CO2
# IFLD=5 -> METHANE (CH4)
# IFLD=6 -> ETHANE (C2H6)
# IFLD=7 -> NITROGEN
# IFLD=8 -> BUTANE (C4H10)
# IFLD=9 -> R245FA
#
#      NT      NP      NSAT  IFLD
#      ---      ---      ---  ---
#      810      810      810    7
#
#      TMIN      TMAX      PMIN      PMAX
#      [DEG R]  [DEG R]  [PSIA]  [PSIA]
#      ---      ---      ---      ---
#      500.      650.      0.1      75.
```

4) NT, NP & NSAT are the data points. Basically there are number of subdivisions for temperature, pressure & saturated pressure respectively. User has to specify these based on their requirement.

5) The TMIN, TMAX, PMIN, PMAX should be based on the particular fluid property for which you are creating the RGP files.

6) After making the required changes to the dat.txt file, click on the exe file which will eventually create the RGP file. It will take a few minutes to generate the RGP file.

One can expand the range a bit due to overshoots that may occur in the solution process. You can alter these as per your requirements.

Attachments
NISTtoRGP.zip