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      NASA-GLENN CHEMICAL EQUILIBRIUM PROGRAM CEA2, FEBRUARY 5, 2004
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REFS: NASA RP-1311, PART I, 1994 AND NASA RP-1311, PART II, 1996

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### CEA analysis performed on Sat 06-Nov-2021 15:56:00

# Problem Type: "Rocket"  (Infinite Area Combustor)

prob case=_____1041 ro equilibrium

# Pressure (1 value):
p,atm= 50
# Chamber/Exit Pressure Ratio (1 value):
pi/p= 50

# Oxidizer/Fuel Wt. ratio (1 value):
o/f= 1.3

# You selected the following fuels and oxidizers:
reac
fuel C2H5OH          wt%=100.0000
oxid O2              wt%=100.0000

# You selected these options for output:
# short version of output
output short
# Proportions of any products will be expressed as Mass Fractions.
output massf
# Heat will be expressed as siunits
output siunits

# Input prepared by this script:/var/www/sites/cearun.grc.nasa.gov/cgi-bin/CEARU
N/prepareInputFile.cgi

### IMPORTANT:  The following line is the end of your CEA input file!
end

      THEORETICAL ROCKET PERFORMANCE ASSUMING EQUILIBRIUM

      COMPOSITION DURING EXPANSION FROM INFINITE AREA COMBUSTOR

Pin =    734.8 PSIA
CASE = _____

      REACTANT              WT FRACTION      ENERGY      TEMP
                        (SEE NOTE)    KJ/KG-MOL      K
FUEL      C2H5OH          1.0000000      0.000      0.000
OXIDANT    O2             1.0000000      0.000      0.000

O/F=    1.30000  %FUEL= 43.478261  R,EQ.RATIO= 1.475797  PHI,EQ.RATIO= 1.602906

      CHAMBER    THROAT    EXIT
Pinf/P      1.0000    1.7358    50.000
P, BAR      50.663    29.188    1.0132
T, K       3635.79   3440.20  2297.51
RHO, KG/CU M 3.3238 0 2.0512 0 1.1208-1
H, KJ/KG      0.00000   -812.23  -4695.86
U, KJ/KG     -1524.22 -2235.20 -5599.90
G, KJ/KG     -46826.0 -45119.2 -34286.0
S, KJ/(KG)(K) 12.8792  12.8792  12.8792

M, (1/n)      19.833    20.101    21.130
(dLV/dLP)t   -1.03555  -1.02889 -1.00147
(dLV/dLT)p    1.6057    1.5209    1.0377
Cp, KJ/(KG)(K) 6.7134    6.2566    2.6229
GAMMA_s      1.1435    1.1416    1.1906
SON VEL,M/SEC 1320.2    1274.5    1037.5
MACH NUMBER   0.000     1.000     2.954

PERFORMANCE PARAMETERS

Ae/At              1.0000    7.6112
CSTAR, M/SEC      1937.9    1937.9
CF                0.6577    1.5814
Ivac, M/SEC       2391.0    3359.6
Isp, M/SEC        1274.5    3064.6

MASS FRACTIONS

*CO      0.41573  0.40807  0.36716
*CO2     0.17741  0.18949  0.25382
COOH      0.00003  0.00002  0.00000
*H        0.00224  0.00188  0.00019
HCO       0.00004  0.00002  0.00000
HO2       0.00008  0.00004  0.00000
*H2       0.01579  0.01550  0.01641
H2O       0.32462  0.33529  0.36097
H2O2      0.00001  0.00001  0.00000
*O        0.00658  0.00455  0.00002
*OH       0.04591  0.03665  0.00139
*O2       0.01156  0.00849  0.00004

* THERMODYNAMIC PROPERTIES FITTED TO 20000.K

NOTE. WEIGHT FRACTION OF FUEL IN TOTAL FUELS AND OF OXIDANT IN TOTAL OXIDANTS
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