

## MCNP Week 8 Homework

1. Write the MCNP mass fraction and atomic fraction inputs for the following compounds:
  - a. Carbon Dioxide
  - b. Sodium Hydroxide
  - c. Uranium Oxide
  - d. Nitrous oxide
2. The mode parameter must include the particle types in what 3 places on an MCNP input?
3. Which MCNP input block references the material card?
4. For the following input files, how many NPS do you guess would result in trustable answers?
  - a.

```
Class
C Cell card
99 0          imp:p=0 $outside world
10 8 -1.00    -1 2  imp:p=1
20 8 -1.00    -2 3  imp:p=1
30 2 -7.87    -3 4  imp:p=1
40 8 -1.00    -4 5  imp:p=1
50 3 -1.00    -5 10 imp:p=1
100 8 -1.59   -10   imp:p=1

C Surface card
1 so 1.2
2 so 1.1
3 so 1.05
4 so 1.03
5 so 1.01
10 sq 4 25 4  0 0 0 -1 0 0.75 0

C Data Card
mode p
NPS ???????
C materials
M8 001000 -0.067134702
   006000 -0.400017318
   008000 -0.532847979
M2 026000 1
M3 001000 -0.1118944
   008000 -0.8881056
sdef eng=0.1 par=p      $ 100 keV photon source at origin
f16:p 100              $ track length estimate of energy deposition in MeV//g
```

## MCNP Week 8 Homework

b.

```
Class
C Cell card
99 0          imp:p=0 $outside world
10 8 -1.00    -1 2  imp:p=1
20 8 -1.00    -2 3  imp:p=1
30 2 -7.87    -3 4  imp:p=1
40 8 -1.00    -4 5  imp:p=1
50 3 -1.00    -5 10 imp:p=1
100 8 -1.59   -10   imp:p=1

C Surface card
1 so 1.2
2 so 1.1
3 so 1.05
4 so 1.03
5 so 1.01
10 sq 4 25 4  0 0 0 -1 0 0.75 0

C Data Card
mode p
NPS ???????
C materials
M8 001000 -0.067134702
   006000 -0.400017318
   008000 -0.532847979
M2 026000 1
M3 001000 -0.1118944
   008000 -0.8881056
sdef erg=1.0 par=p      $ 100 keV photon source at origin
f16:p 100              $ track length estimate of energy deposition in MeV//g
```

c.

```
Class
C Cell card
99 0          imp:p=0 $outside world
10 8 -1.00    -1 2  imp:p=1
20 8 -1.00    -2 3  imp:p=1
30 3 -1.00    -3 4  imp:p=1
40 8 -1.00    -4 5  imp:p=1
50 3 -1.00    -5 10 imp:p=1
100 8 -1.59   -10   imp:p=1

C Surface card
1 so 1.2
2 so 1.1
3 so 1.05
4 so 1.03
5 so 1.01
10 sq 4 25 4  0 0 0 -1 0 0.75 0

C Data Card
mode p
NPS ???????
C materials
M8 001000 -0.067134702
   006000 -0.400017318
   008000 -0.532847979
M3 001000 -0.1118944
   008000 -0.8881056
sdef erg=0.5 par=p      $ 100 keV photon source at origin
f16:p 100              $ track length estimate of energy deposition in MeV//g
```

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