M17.3 KMART — KENO V.a POSTPROCESSOR

M17.3.1 INTRODUCTION

KMART (Keno Module for Activity-Reaction Rate Tabulation) is a new module whose primary purpose is to postprocess a KENO V.a restart file with the corresponding working cross section library to generate nuclide activity tables. It also allows collapsing and printing fluxes calculated by KENO V.a. The KENO V.a problem must have a mixing table, must calculate the fluxes, and must write a restart file containing the calculated data.

M17.3.2 KMART INPUT DATA

Input data for KMART is read into the program using free form blocked input similar to KENO V.a. The data blocks are started with a READ *BLOCK NAME* and ended with an END *BLOCK NAME.* There are three data blocks that KMART can read. The first data block is named INITIAL, and the input starts with the keywords READ INITIAL. There are six possible keyworded entries in this block that may be entered in any order.

Keyword	Variable	Description
PRTVOLS	PRINT_VOLUMES	a flag to cause the volumes calculated by KENO V.a to be printed by KMART.
KUNIT=	KUNIT	The logical unit number of the KENO V.a restart file.
XUNIT=	XUNIT	The logical unit number of the cross section library.
ACTBYGRP	ACTIVITIES_BY_GROUP	A flag which turns on printing activities by group. If the fluxes are collapsed, the activities will be by broad group, otherwise they will be by fine group.
RRPVOL	REACTION_RATES_PER_ UNIT_VOLUME	A flag causing the activities to be printed per unit volume rather than integrated over the volume of the region.
KENO3D	NK3D	Unit number on which to write data for plotting with KENO-3D.
	K3DFILE	File name of the KENO input file (minus the trailing extension). The plot data file will be named K3DFILE.kmt.

A sample data block is given below.

```
READ INITIAL    KUNIT=35 XUNIT=4      END INITIAL
```

One of the next two blocks is required, but it could be either one, or both can be specified if desired. If both are entered, they can be either one first. The next data block specified is named ACTIVITY, and the input starts with the keywords READ ACTIVITY. It contains the data specifying which activities are to be calculated. The activities are specified by pairs of numbers giving the nuclide identifier and the reaction type identifier desired. A list of reaction types, also known as MT numbers, can be found in Sect. F3.B. These pairs are repeated until all the desired activities have been specified. If the nuclides are identified by the SCALE scheme, then the nuclide can be specified most explicitly by using the mixture prefix defined by CSAS, or, by omitting the mixture prefix, the activity will be calculated for each region in which the nuclide occurs. If the nuclide specifies a natural element identifier (1000*Z) and individual isotopes occur on the cross section library, the isotope activities will be summed to produce the total activity for the element. The data pair is described below.

Variable	Description
NUCLIDE	The nuclide identification number on the cross section library for this activity request.
REACTION	The reaction type identifier for this activity request.

If no activities are desired, then the block can be omitted. A sample block is given below.

```
READ ACTIVITY 92235 18 92235 27 92235 1452    END ACTIVITY
```

The other input block is named COLLAPSE, and starts with the keywords READ COLLAPSE. There are two keyworded entries that may be input in this block. A flux factor to normalize the fluxes by can be specified. It defaults to 1. The last fine group in the current broad group is the other entry. The broad groups are specified sequentially starting with group one. If the flux factor is specified more than once, the last value given is used. The data is specified as below.

Keyword	Variable	Description
FACTOR	FACTOR	A flux multiplier used to scale the fluxes before printing (default 1.0)
LASTG=	LAST_GROUP	The last fine group to be included in the current broad group. The broad groups are input sequentially starting with group one.

If no collapsed fluxes are desired, then the block can be omitted. A sample block is given below.

```
READ COLLAPSE    FACTOR 1.0 LASTG=10 LASTG=20 LASTG=30 LASTG=44   END COLLAPSE
```

M17.3.3 KMART I/O SPECIFICATIONS

KMART requires the following I/O devices.

Logical Unit	Purpose
5	Standard definition input
6	Output
KUNIT	KENO V.a restart file
XUNIT	AMPX working cross section library
16	scratch file
NK3D	file containing plot data for KENO-3D

The following is a sample input data stream for KMART:

```
#kmart
read initial   kunit=64 xunit=4 prtvols   end initial
read activity
    1001 27
    6012 27
    8016 27
   92235 18 92235 27 92235 1452
   92238 18 92238 27 92238 1452
   94238 18 94238 27 94238 1452
   94239 18 94239 27 94239 1452
   94240 18 94240 27 94240 1452
   94241 18 94241 27 94241 1452
   94242 18 94242 27 94242 1452
   92000 18 92000 27 92000 1452
   94000 18 94000 27 94000 1452
 end activity
read collapse    lastg=10 lastg=20 lastg=30 lastg=44
 end collapse
end
```