

1 Leach CH/cement

This option can be used to selectively leach (remove) a portion or the complete volume of one or more phases from a hydrated microstructure. The calcium hydroxide (CH) and the initial four cement clinker phases all can be leached, and the user selects which phases to include in a specific execution of the algorithm.

The input form for the leaching simulation is shown in Figure 1. The fields are:

1.1 Random number seed

The user must enter a *negative integer* (in the range [-32767,-1]) in this field.

1.2 Microstructure to leach

The user must supply the file name of the microstructure to be leached, complete with any extensions.

Random number seed (negative integer):

Microstructure to leach
(with extension):

Name of leached image
(complete with extension):

Phases to leach
(default is CH **only**): CH C₃S C₂S C₃A C₄AF

◆ Leach for cycles, **OR**

◆ Leach selected phases completely from microstructure

Leaching probability:

E-mail address:

It may take 15-20 minutes to leach the image after you submit.

You will be notified by e-mail at the above address when leaching is complete.

Figure 1: Form for launching a simulation of leaching of one or more phases from a cement paste microstructure.

1.3 Name of leached image

A new file name, in which to store the microstructure after leaching, must be provided. If the file name already exists, the user will be notified and asked to specify a different file name.

1.4 Phases to leach

Currently, the user can select to leach any combination of the following phases from a cement paste microstructure: CH, C₃S, C₂S, C₃A, and C₄AF. The default is to leach only CH.

1.5 Termination of leaching

Two options are available:

1. Leach for a specified number of cycles (default 100)
2. Leach the selected phases completely from the microstructure

If the first option is selected, then leaching proceeds by the specified number of reaction cycles, progressing from the exterior of the microstructure inward. The reaction probability is specified by the user (see the next entry). If the second option is selected, then the microstructure is scanned once and all pixels of the user-specified phase(s) are converted to saturated porosity.

1.6 Leaching probability

If the user chooses to leach for a defined number of cycles, then a leaching probability (p_l in the range 0.0-1.0), is required in this field.

1.7 E-mail address

The program `leach3d` that performs the leaching simulation may take several minutes to complete. The VCCTL will automatically send a note to the e-mail address provided when execution completes. If no e-mail address is supplied, then a note will not be generated.

NOTE: The VCCTL is set up to perform only one leaching simulation at any specific time. If the system is already executing `leach3d` for one microstructure when another request is submitted, the user will be notified to resubmit the request at a later time.

References