```
initParms <- function(newParms = NULL) {
  parms <- c(
     BW = 0.0,
    QPC = 0.0,
    QCC = 0.0,
    QLC = 0.0,
    QFC = 0.0,
    QSC = 0.0,
    QKC = 0.0,
    VLC = 0.0,
   VLUC = 0.0,
    VFC = 0.0,
    VRC = 0.0,
    VSC = 0.0,
    VKC = 0.0,
     PL = 0.0,
    PLU = 0.0,
     PF = 0.0,
     PS = 0.0,
     PR = 0.0,
     PB = 0.0,
     PK = 0.0,
     MW = 0.0,
  VMAXC = 0.0,
     KM = 0.0,
VMAXCLU = 0.0,
   KMLU = 0.0,
  KFLUC = 0.0,
VMAXCKid = 0.0,
   KMKD = 0.0,
  TSTOP = 0.0,
   CONC = 0.0
  )
  parms <- within(as.list(parms), {
     BW = 0.03;
    QPC = 30.;
    QCC = 30.;
    QLC = 0.161;
    QFC = 0.07;
    QSC = 0.15;
    QKC = 0.10;
    VLC = 0.055;
   VLUC = 0.007;
    VFC = 0.05;
    VRC = 0.014;
    VSC = 0.77;
    VKC = 0.014;
     PL = 1.25;
    PLU = 2.38;
     PF = 17.3;
     PS = 0.58;
     PR = 1.76;
     PB = 7.83;
     PK = 1.76;
```

```
     MW = 88.5;
  VMAXC = 8.88;
     KM = 0.08;
VMAXCLU = 0.11;
   KMLU = 0.25;
  KFLUC = 0.0;
VMAXCKid = 0.03;
   KMKD = 9.59;
  TSTOP = 7.0;
   CONC = 13.0;
  })
  if (!is.null(newParms)) {
    if (!all(names(newParms) %in% c(names(parms)))) {
      stop("illegal parameter name")
    }
  }
  if (!is.null(newParms))
    parms[names(newParms)] <- newParms
  out <- .C("getParms",  as.double(parms),
            out=double(length(parms)),
            as.integer(length(parms)))$out
  names(out) <- names(parms)
  out
}

Outputs <- c(
    "MASBAL",
    "CLU",
    "CL",
    "CK",
    "CS",
    "CR",
    "CF",
    "CVLUM",
    "ppm",
    "AMP",
    "AMPLU",
    "AMPK",
    "cvl",
    "qcbal",
    "vbal"
)

initStates <- function(parms, newStates = NULL) {
  Y <- c(
    AI = 0.0,
    AX = 0.0,
    AM = 0.0,
  AMLU = 0.0,
   AMK = 0.0,
   ALU = 0.0,
    AL = 0.0,
    AK = 0.0,
    AS = 0.0,
```

```
    AR = 0.0,
    AF = 0.0
  )
  if (!is.null(newStates)) {
    if (!all(names(newStates) %in% c(names(Y)))) {
      stop("illegal state variable name in newStates")
    }
    Y[names(newStates)] <- newStates
  }
  Y
}
```