

```
In[1]:= Needs["IdentifiabilityAnalysis`"]
        startTime = AbsoluteTime[]
```

```
Out[2]= 3.6884675522843210 × 109
```

```
In[3]:= vars = {x1, x2, x3, x4}
```

```
Out[3]= {x1, x2, x3, x4}
```

```
In[4]:= params = {a1, a2, b1, b2, ka, kc, vm, c0, g}
```

```
Out[4]= {a1, a2, b1, b2, ka, kc, vm, c0, g}
```

```
In[5]:= sys = {x1'[t] == a1*(x2[t] - x1[t]) - ka*vm*x1[t]/(kc*ka + kc*x3[t] + ka*x1[t]),
               x2'[t] == a2*(x1[t] - x2[t]),
               x3'[t] == b1*(x4[t] - x3[t]) - kc*vm*x3[t]/(kc*ka + kc*x3[t] + ka*x1[t]),
               x4'[t] == b2*(x3[t] - x4[t]),
               x1[0] == c0, x2[0] == 0, x3[0] == g*c0, x4[0] == 0}
```

```
Out[5]= {x1'[t] == a1*(-x1[t] + x2[t]) -  $\frac{ka\ vm\ x1[t]}{ka\ kc + ka\ x1[t] + kc\ x3[t]}$ , x2'[t] == a2*(x1[t] - x2[t]),
          x3'[t] == -  $\frac{kc\ vm\ x3[t]}{ka\ kc + ka\ x1[t] + kc\ x3[t]}$  + b1*(-x3[t] + x4[t]),
          x4'[t] == b2*(x3[t] - x4[t]), x1[0] == c0, x2[0] == 0, x3[0] == c0 g, x4[0] == 0}
```

```
In[6]:= output = {x1[t], x4[t]}
```

```
Out[6]= {x1[t], x4[t]}
```

```
In[7]:= iad = IdentifiabilityAnalysis[{sys, output}, vars, params, t]
```

```
Out[7]= IdentifiabilityAnalysisData[True, <>]
```

```
In[8]:= iad["IdentifiableQ"]
```

```
Out[8]= True
```

```
In[9]:= iad["DegreesOfFreedom"]
```

```
Out[9]= 0
```

```
In[10]:= iad["NonIdentifiableParameters"]
```

```
Out[10]= {}
```

```
In[11]:= endTime = AbsoluteTime[]
          N[endTime - startTime]
```

```
Out[11]= 3.6884675529534635 × 109
```

```
Out[12]= 0.669143
```

```
In[13]:=
```