Acetylsalicylic acid (ASA) on Hydroxyethylcellulose/Polyacrylamide gel (HEC/PAAm) as a proposal for a dermatological compress. Mathematical modeling of ASA release kinetics.

Suplementary data

Simulation in Matlab to obtain the adjustment curve, error, and coefficients of the experimental data from the ASA released in solution Ethanol Water and Buffer

Ethanol and water

```
x=[15;30;45;60;120;180;240;300;360;420;480];
y=[0.0949;0.1547;0.2042;0.2451;0.2976;0.3312;0.3439;0.36;0.3719;0.3832;0.
3941];
y1=[0.1091;0.1606;0.2034;0.2446;0.3003;0.3188;0.3258;0.33;0.3384;0.3499;0
.3621 ];
y2=[0.0608;0.1004;0.1316;0.1568;0.1968;0.2105;0.2153;0.2193;0.2288;0.2427
;0.2466];
n=length(y);
p=polyfit(log(x),log(y),1);
p1=polyfit(log(x),log(y1),1);
p2=polyfit(log(x),log(y2),1);
fprintf('exponent a= %2.5f\n',p(1));
fprintf('coefficient c = %3.5f\n',(exp(p(2))));
fprintf('exponent a1= %2.5f\n',p1(1));
fprintf('coefficient c1 = %3.5f\n',(exp(p1(2))));
fprintf('exponent a1= %2.5f\n',p2(1));
fprintf('coefficient c1 = %3.5f\n',(exp(p2(2))));
hold on
plot(x,y,'ro','markersize',4,'markerfacecolor','r')
plot(x,y1,'bo','markersize',4,'markerfacecolor','k')
plot(x,y2,'ko','markersize',4,'markerfacecolor','k')
z=@(x)  (exp(p(2)))*x.^p(1);
z1=@(x)  (exp(p1(2)))*x.^p1(1);
z2=@(x)  (exp(p2(2)))*x.^p2(1);

fplot(z,[x(1),x(end)])
fplot(z1,[x(1),x(end)])
fplot(z2,[x(1),x(end)])
xlabel('t(min)')
ylabel('ASA released mg/mL')
grid on
title('Adjustment curve (Ethanol and H2O)')
plot(x,y,'r')
plot(x,y1,'b')
plot(x,y2,'k')
hold off


suma=0;
for i=1:n
```

```
    suma=suma+(y(i)-z(x(i)))^2; %Sum of deviation squared
end

suma1=0;
for i=1:n
    suma1=suma1+(y1(i)-z1(x(i)))^2;
end

suma2=0;
for i=1:n
    suma2=suma2+(y2(i)-z2(x(i)))^2;
end

desvrms=sqrt(suma);% Quadratic mean value
desvrms1=sqrt(suma1);
desvrms2=sqrt(suma2);

error=desvrms/n
error1=desvrms1/n
error2=desvrms2/n
```

Buffer

```
x=[15;30;45;60;120;180;240;300;360;420;480];
y=[0.1427;0.1938;0.2191;0.2349;0.2436;0.2513;0.2576;0.2597;0.2663;0.2683;
0.2697];
y1=[0.0427;0.073;0.1136;0.1335;0.1438;0.1517;0.1563;0.1582;0.1617;0.1645;
0.1657];
y2=[0.2224;0.2775;0.2913;0.2983;0.3048;0.3081;0.3113;0.3127;0.3133;0.3136
;0.3144];
n=length(y);
p=polyfit(log(x),log(y),1);
p1=polyfit(log(x),log(y1),1);
p2=polyfit(log(x),log(y2),1);
fprintf('exponent a= %2.5f\n',p(1));
fprintf('coefficient c = %3.5f\n',(exp(p(2))));
fprintf('exponent a1= %2.5f\n',p1(1));
fprintf('coefficient c1 = %3.5f\n',(exp(p1(2))));
fprintf('exponent a1= %2.5f\n',p2(1));
fprintf('coefficient c1 = %3.5f\n',(exp(p2(2))));
hold on
plot(x,y,'ro','markersize',4,'markerfacecolor','r')
plot(x,y1,'bo','markersize',4,'markerfacecolor','k')
plot(x,y2,'ko','markersize',4,'markerfacecolor','k')
z=@(x)  (exp(p(2)))*x.^p(1);
z1=@(x)  (exp(p1(2)))*x.^p1(1);
z2=@(x)  (exp(p2(2)))*x.^p2(1);

fplot(z,[x(1),x(end)])
fplot(z1,[x(1),x(end)])
fplot(z2,[x(1),x(end)])
xlabel('t(min)')
ylabel('ASA released mg/mL')
grid on
title('Adjustment curve (Buffer)')
```

```
plot(x,y,'r')
plot(x,y1,'b')
plot(x,y2,'k')
hold off

suma=0;
for i=1:n
    suma=suma+(y(i)-z(x(i)))^2; %Sum of deviation squared
end

suma1=0;
for i=1:n
    suma1=suma1+(y1(i)-z1(x(i)))^2;
end

suma2=0;
for i=1:n
    suma2=suma2+(y2(i)-z2(x(i)))^2;
end

desvrms=sqrt(suma);% Quadratic mean value
desvrms1=sqrt(suma1);
desvrms2=sqrt(suma2);

error=desvrms/n
error1=desvrms1/n
error2=desvrms2/n
```