

# Conductivity measurement of Gelatin

## Abstract

- Gelatin alone has high electrical conductivity and difficult to spin for a long time (more than 1 hour) even if it is fiberized.
- In order to enable spinning of gelatin alone for a long time, we focused on its isoelectric point.
- We presumed that conductivity will go down at the isoelectric point, which may facilitate spinning.
- We tried to find the isoelectric point of gelatin by changing the pH.

## Approach

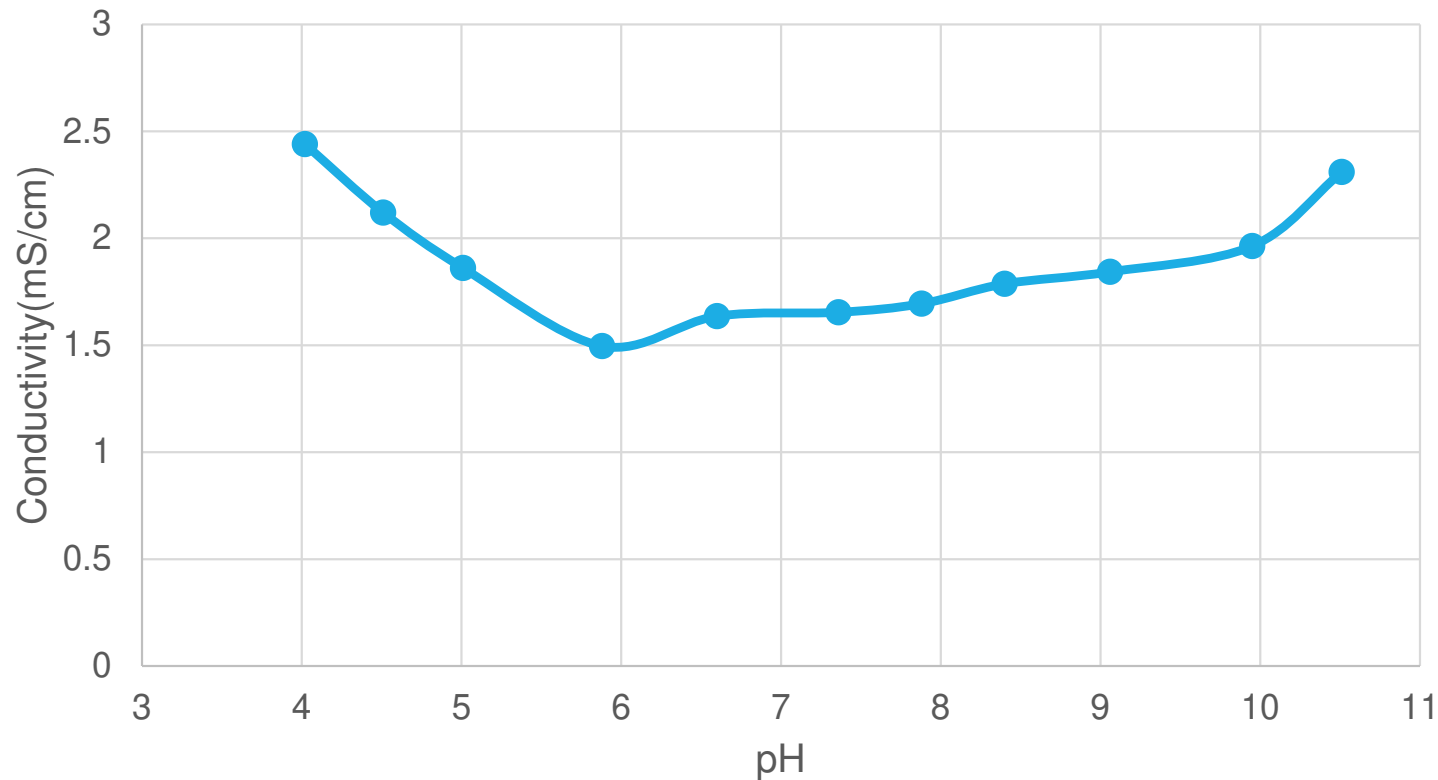
- We made measurement of conductivity and watched its variation by controlling pH.
- We used solutions to control pH such as sodium hydroxide, acetic acid, and hydrochloric acid.

# Conductivity measurement of gelatin (cow-derived)

- pH 5.88 before measurement

To control pH we used acetic acid for acidification and sodium hydroxide for alkalization.

Gelatin (cow-derived)



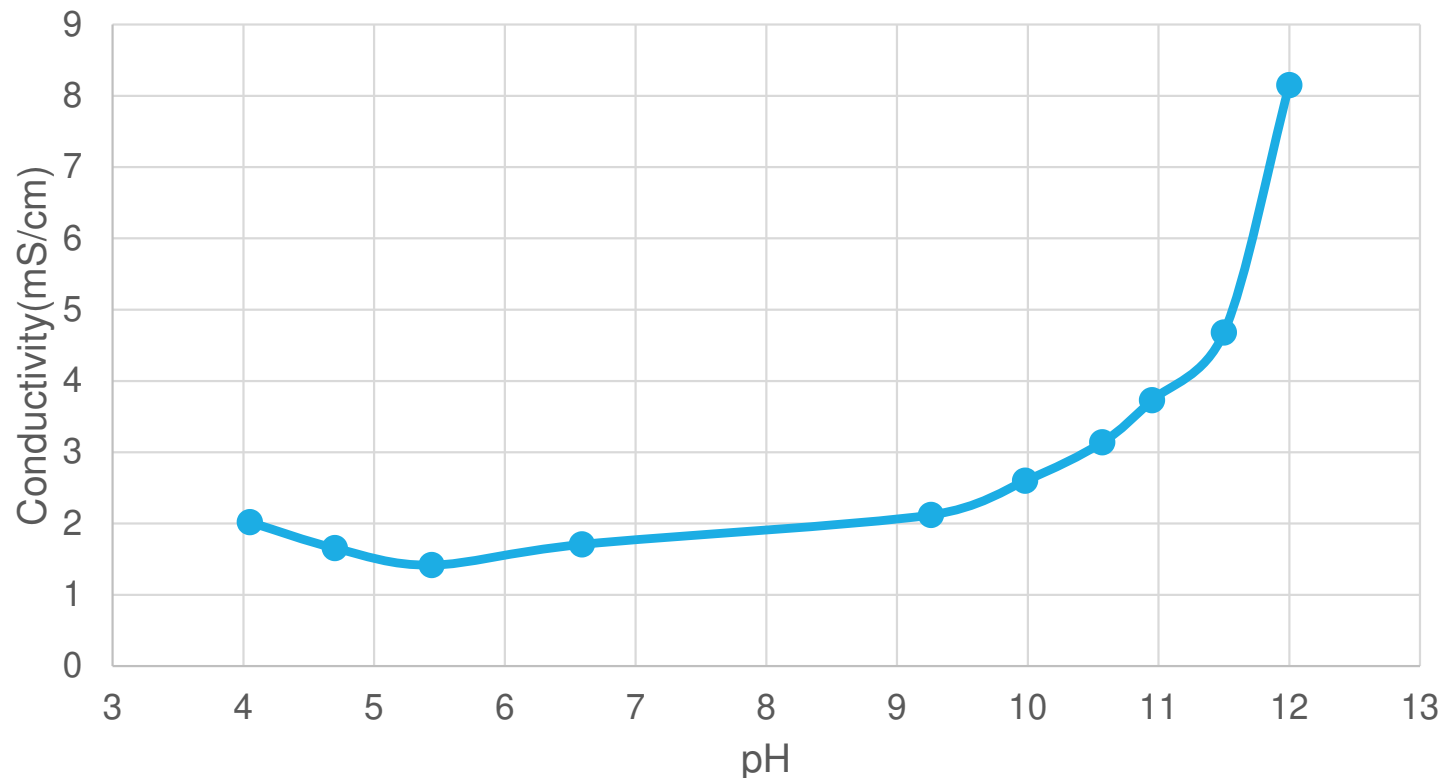
pH	4.02	4.51	5.01	5.88	6.6	7.36	7.88	8.4	9.06	9.95	10.51
Conductivity ( $\mu\text{S/cm}$ )	2.44	2.12	1.861	1.496	1.636	1.654	1.694	1.787	1.843	1.964	2.31

# Conductivity measurement of gelatin (pig-derived)

- pH 5.44 before measurement

To control pH we used acetic acid for acidification and sodium hydroxide for alkalization.

Gelatin (pig-derived)

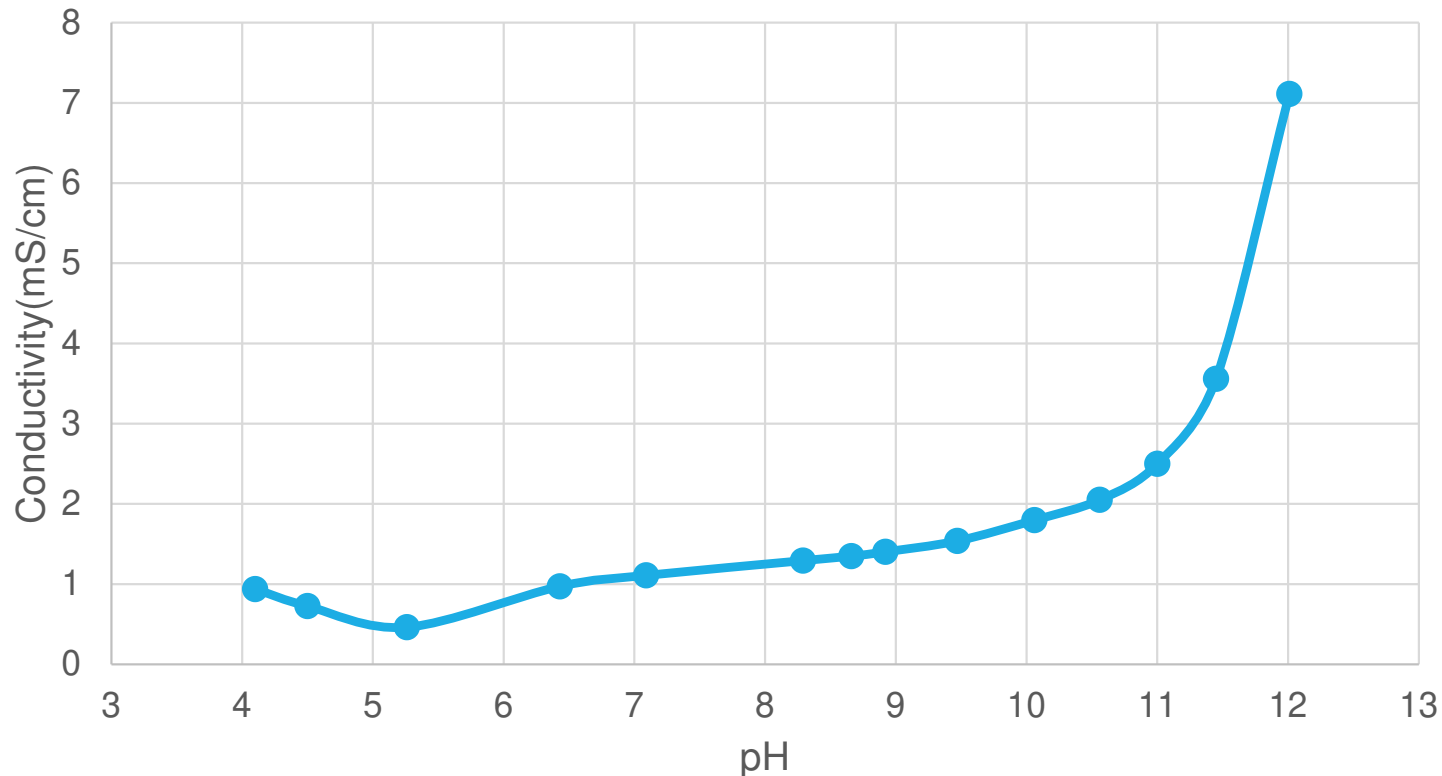


pH	4.05	4.7	5.44	6.59	9.26	9.98	10.57	10.95	11.5
Conductivity (mS/cm)	2.02	1.656	1.417	1.708	2.121	2.60	3.14	3.73	4.68

# Conductivity measurement of gelatin (fish -derived)

- pH5.26 before measurement

To control pH we used acetic acid for acidification and sodium hydroxide for alkalization.  
Gelatin (fish-derived)



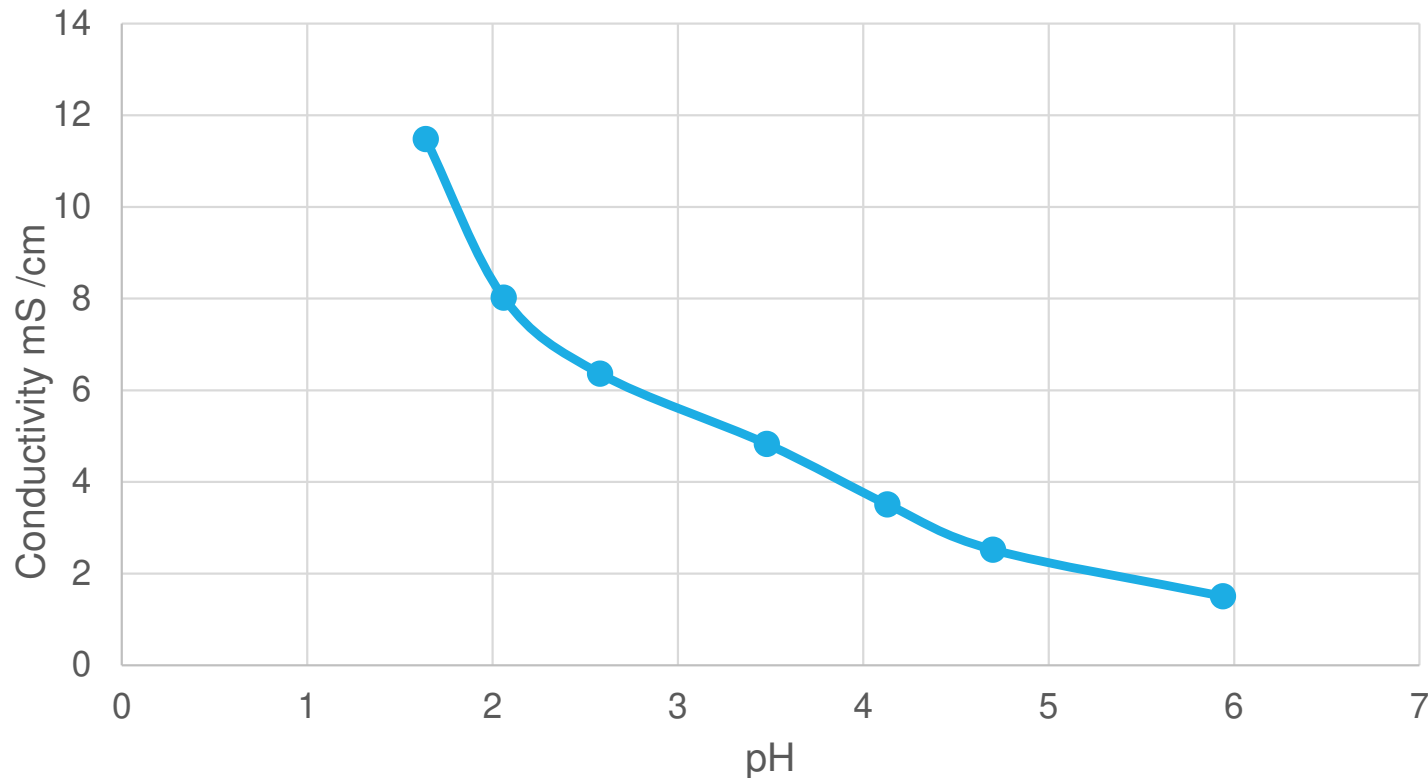
pH	4.1	4.5	5.26	6.43	7.09	8.29	8.66	8.92	9.47	10.06	10.56	11	11.45	12.01
Conductivity (mS/cm)	0.937	0.725	0.463	0.971	1.108	1.292	1.349	1.403	1.537	1.798	2.05	2.5	3.56	7.11

# Conductivity measurement of gelatin (cow-derived)

- pH 5.94 before measurement

To control pH we used hydrochloric acid.

Gelatin (cow-derived)



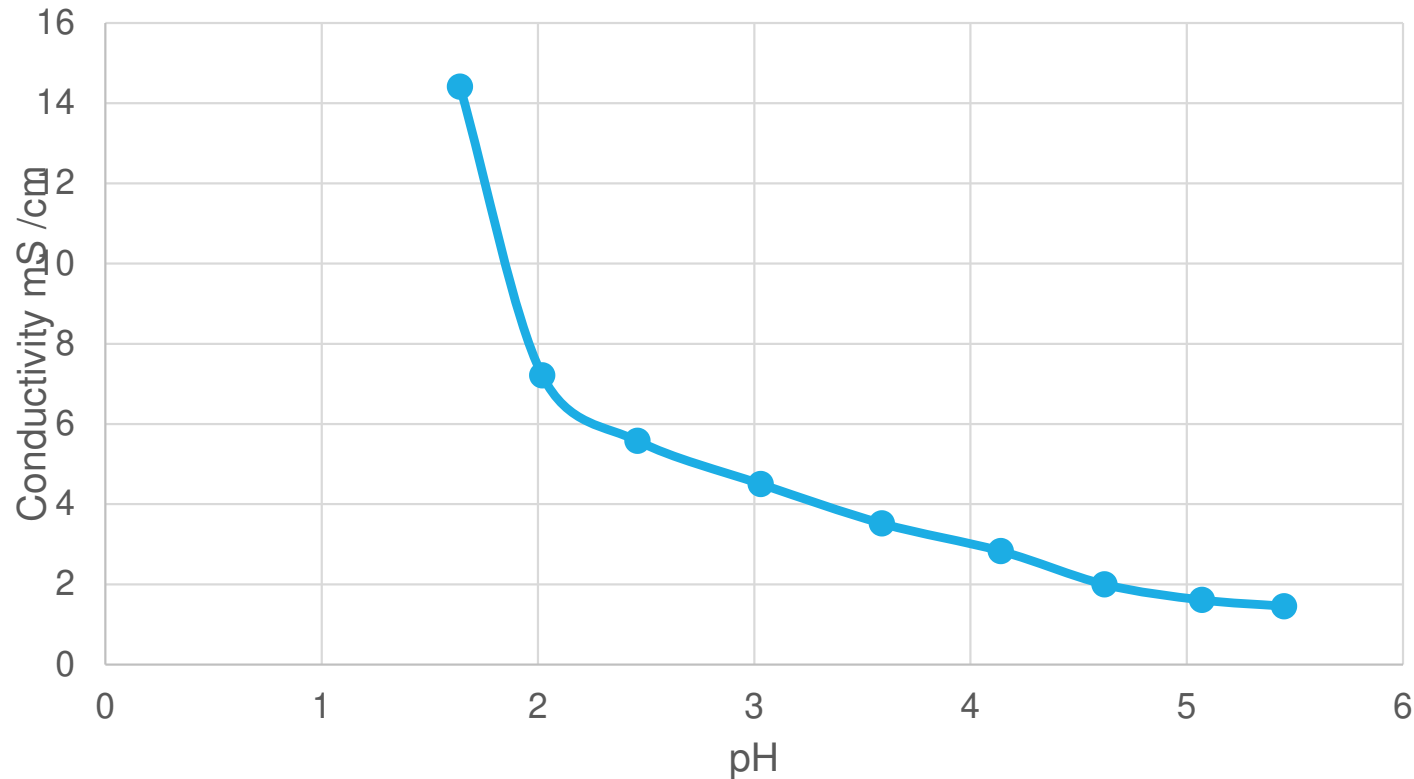
pH	1.64	2.06	2.58	3.48	4.13	4.7	5.94
Conductivity (mS/cm)	11.48	8.02	6.36	4.83	3.51	2.52	1.503

# Conductivity measurement of gelatin (pig -derived)

- pH5.45 before measurement

To control pH we used hydrochloric acid.

Gelatin (pig-derived)



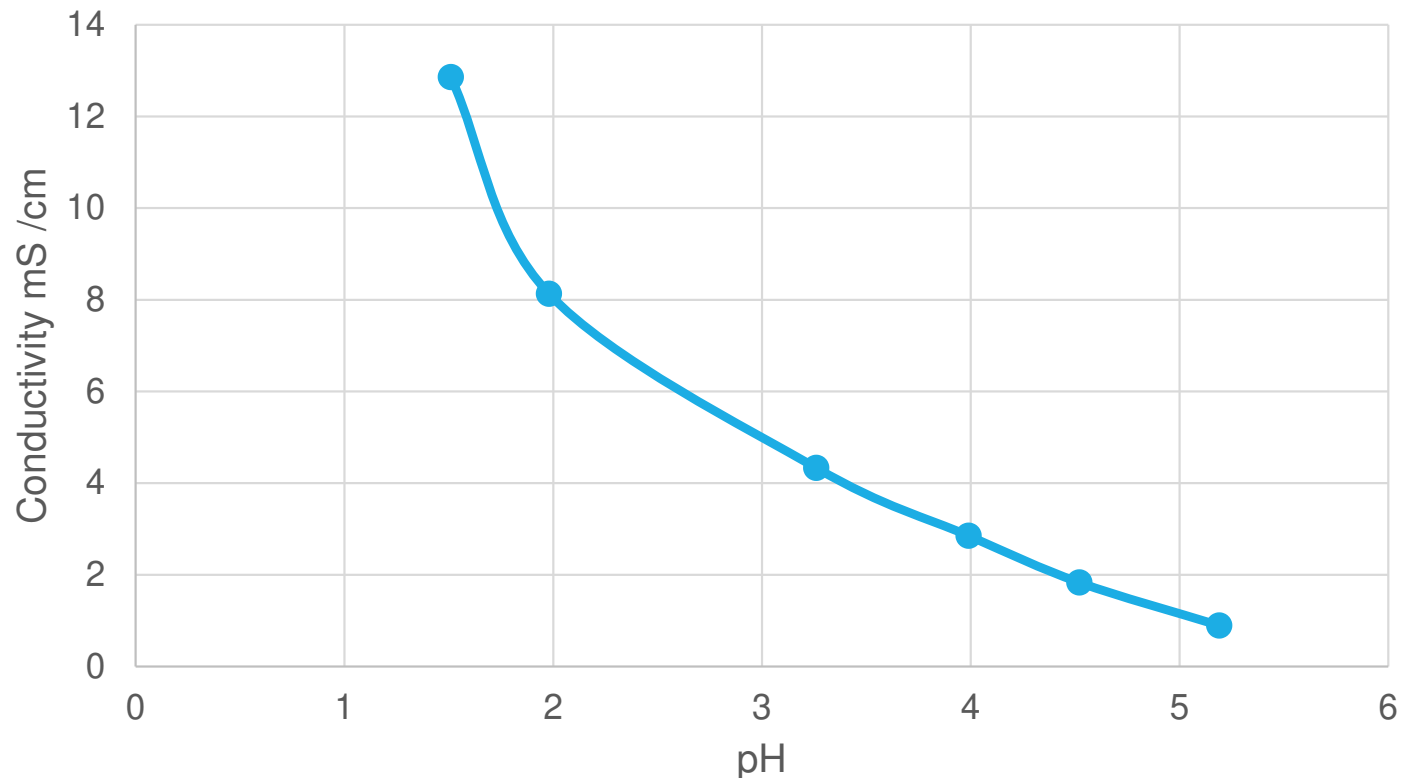
pH	1.64	2.02	2.46	3.03	3.59	4.14	4.62	5.07	5.45
Conductivity (mS/cm)	14.41	7.21	5.58	4.5	3.52	2.83	2	1.611	1.455

# Conductivity measurement of gelatin (fish -derived)

- pH5.19 before measurement

To control pH we used hydrochloric acid.

Gelatin (fish-derived)



pH	1.51	1.98	3.26	3.99	4.52	5.19
Conductivity (mS/cm)	12.86	8.13	4.33	2.85	1.832	0.892

# Conductivity measurement of Gelatin

## Conclusion

- Conductivity of the original gelatin solution before controlling indicated the lowest value.
- We could not find the isoelectric point to decrease the conductivity.

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## Request

- We still need to search for a method to spin gelatin for a long time period. If you have any idea or suggestion regarding this research, kindly please contact us.