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Evaluation of *in vitro* degradation rate of hyaluronic acid-based hydrogel cross-linked with 1, 4-butanediol diglycidyl ether (BDDE) using RP-HPLC and UV-Vis spectroscopy

Mohammed Al Sibani¹, Ahmed Al Harassi² and Reinhard H H Neubert¹

¹Martin Luther University Halle-Wittenberg, Germany

²University of Nizwa, Oman

A hyaluronic acid (HA) was cross-linked with 1, 4-butanediol diglycidyl ether to produce nine BDDE-HA hydrogels. The degradation rates of six hydrogels were evaluated by HPLC and UV-Visible spectroscopy. The percentage amount of N-acetyl glucosamine (NAG) obtained after one-day enzymatic digestion to the total amount obtained after complete digestion was an indicative of the degradation rate of each hydrogel. The results were calculated with 95% confidence interval and showed ($62.6\% \pm 12.3$ w/w), precision value % R.S.D=7.95, average recovery=81.0%, LOD=6.4 µg/ml for HPLC and (63.3 ± 13.9 w/w), precision value %R.S.D=8.83, average recovery=83.1%, LOD=5.4 µg/ml for UV method. The two methods showed also good linearity with correlation coefficients (R²) of 0.998 and 0.9995 for HPLC and UV method, respectively. For a comparison purpose, the other three hydrogels were rated using the conventional weight loss method which showed relatively higher degradation rates with an average of ($73.4\% \pm 5.7$ w/w), %R.S.D=3.13. Statistical analysis revealed that there was no significant difference between HPLC and UV-Visible methods, however, these values differed significantly ($p < 0.05$) from the value obtained from the weight loss method.

Biography

Mohammed Al Sibani has completed his Master's degree in 2008 from Huddersfield University, UK in the field of Analytical Chemistry. Currently, he is a PhD candidate since July 2013 at the Department of Pharmacy, University of Halle-Wittenberg, Germany and his thesis topic is related to the enhancement of stability and viscoelastic properties of HA dermal fillers cross-linked with BDDE. He has worked as an Analysis and Application Technician in mass spectrometry lab at Nizwa University for the last 6 years.

sibanimm@unizwa.edu.om

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